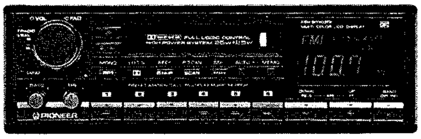
PIONEER

Service Manual



The photo shows the model KEH-9030SDK/WG.

ORDER NO.
CRT1051

CASSETTE CAR STEREO WITH FM/MW/LW ELECTRONIC TUNER

KEH-9030SDK WG

KEH-9030 EW

CASSETTE CAR STEREO WITH FM/AM ELECTRONIC TUNER

KEH-9020 US, CA, G

Note:

- ● See the separate manual CRT-468 for the cassette mechanism Assy (CX-156/A).
- ● In regard to the KEH-9020/G, press the AUTO button and the CLOCK button at the same time for 0.5 seconds to clear the content of the previously preset channel momory so that it is initialized to match each destination (US <–> ES).

CONTENTS

1. SPECIFICATIONS 1
2. PARTS LOCATION.......................2
3. CONNECTION...........................3
4. OPERATION............................4
5. BLOCK DIAGRAM........................8
6. LEVEL DIAGRAM.......................12
7. CIRCUIT DESCRIPTION.................14
8. DISASSEMBLY 27
9. ADJUSTMENT..........................29
10. SCHEMATIC CIRCUIT DIAGRAM (KEH-9030SDK/WG)..................46
11. CONNECTION DIAGRAM (KEH-9030SDK/WG) . .50
12. SCHEMATIC CIRCUIT DIAGRAM (KEH-9030/EW) 54
13. CONNECTION DIAGRAM (KEH-9030/EW) 58
14. SCHEMATIC CIRCUIT DIAGRAM (KEH-9020/US, CA) 62
15. CONNECTION DIAGRAM (KEH-9020/US, CA). . .66
16. SCHEMATIC CIRCUIT DIAGRAM (KEH-9020/G) 70
17. CONNECTION DIAGRAM (KEH-9020/G) 74
18. CABINET EXPLODED VIEW...............78
19. CHASSIS EXPLODED VIEW 81
20. CASSETTE MACHANISM ASSEMBLY EXPLODED VIEW 84
21. ELECTRICAL PARTS LIST...............87
22. PACKING METHOD......................94

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A. TEL: (213) 420-5700
PIONEER ELECTRONIC (EUROPE) N.V. Keetberglaan 1, 2740 Beveren, Belgium TEL: 03/775·28·08
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia
TEL: (03) 580-9911

FT © MAY 1986 Printed in Japan

1. SPECIFICATIONS

General

Power source . . . . . . 14.4 V DC (10.8–15.6 V allowable)
Grounding system . . . . Negative type
Max. current consumption 5.5A
Dimensions (chassis) . . . . . . 180(W)X50(H)X150(D) mm
[7-1/8(W)X2(H)X5-7/8(D) in.]
(front face) . . . . . 188(W)X58(H)X10(D) mm
[7-3/8(W)X2-1/4(H)X3/8(D) in.]
Weight. . . . . 1.5 kg (3.3 lbs.)

Amplifier

Continuous power output is 11 W per channel min. into 4 ohms, both channels driven 50 to 15,000 Hz with no more than 5% THD.

Continuous power output. . 13 W+13 W (1% dist. at 1 kHz)
Maximum power output. . . . . 25 W+25 W (EIAJ)
Load impedance . . . . 4Ω (4–8Ω allowable)
Pre out output level (KEH-9020/US, CA)
Nominal output level . . . . 70 mV/500 mV (switchable)
Maximum output level . 200 mV/1,000 mV (switchable)
Output impedance. . . . . 1 kΩ
Tone controls (bass). . . . . ±10 dB (100 Hz)
(treble) . . . . ±10 dB (10 kHz)
Loudness contour . . . . . +12 dB (100 Hz), +7 dB (10 kHz)
(volume: –30 dB)

Tape player

Tape. . . . . .Compact cassette tape (C-30–C-90)
Tape speed. . . 4.76 cm/sec. (+0.14 cm/sec., –0.05 cm/sec.)
Fast forward/rewind time . . . . . Approx. 100 sec. for C-60
Wow & flutter. 0.09% (WRMS)
Frequency response . . . . . . Metal: 50–20,000 Hz (±3 dB)
Normal: 50–17,000 Hz (±3 dB)
Stereo separation. . . . . .45 dB
Signal-to-noise ratio. . . . .
Dolby C NR IN: 67 dB (IHF-A netowrk)
Dolby B NR IN: 60 dB (IHF-A network)
Dolby NR OUT: 52 dB (IHF-A network)

FM tuner

Frequency range (KEH-9030SDK/WG,
9030/EW, 9020/G (ES) . . . . 87.5–108.0 MHz
(KEH-9020/US, CA, G (US) . . . . 87.9–107.9 MHz
Usable sensitivity. . . . . .12 dBf (1.1 μV/75Ω, mono)
50 dB quieting sensitivity . . . .17 dBf (1.9 μV/75Ω, mono)
Signal-to-noise ratio. . . . . .70 dB (IHF-A network)
Distortiom. . . . . .0.3% (at 65 dBf, 1 kHz, stereo)
Frequency response. . . . . 50–15,000 Hz (±3 dB)
Stereo separation. . . . . .40 dB (at 65 dBf, 1 kHz)

MW (AM) tuner

Frequency range (KEH-9030SDK/WG,
9030/EW, 9020/G (ES) 531–1602kHz
(KE-9020/US, CA, 9020/G (US) . . . . . 530–1620 kHz
Usable sensitivity. . . . . .18 μV (25 dB) (S/N: 20 dB)
Selectivity . . . . 50 dB (±10 kHz)

LW tuner (KEH-9030SDK/WG, 9030/EW)

Frequency range . . . . 153–281 kHz
Usable sensitivity. . . . . .30 μV (30 dB) (S/N: 20 dB)
Selectivity . . . . 50 dB (±9 kHz)

These specifications were determined and are presented in accordance with specification standards established by the Ad Hoc Committe of Car Stereo Manufacturers.

Note:

Specifications and the design are subject to possible modification without notice due to improvements.

- **Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.**
- **Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.**

3. CONNECTION

Note:

- To avoid shorts in the electrical system, be sure to disconnect the battery ⊖ cable before beginning installation.
- Replace fuses only with the types stipulated on the fuse holder.
- Be sure to properly connect the color coded leads. Failure to do so can cause malfunctions.
- Since a unique BPTL circuit is employed, never wire so the speaker leads are directly grounded or the left and right speaker ⊖ leads are common.
- Speakers connected to this unit must be high-power type possessing maximum input of at least 25 W and impedance of 4 to 8 ohms. Connecting speakers with output and/or impedance values other than those noted here can damage the speakers.

Black (ground)	To vehicle (metal) body.
Yellow	To lighting switch terminal.
Blue	To auto-antenna power terminal (Max. 300 mA 12 V DC).
Red	To electric terminal controlled by ignition switch (12 V DC) ON/OFF.
Orange	To terminal always supplied with power regardless of ignition switch position.
Gray	To right speaker ⊕ terminal.
Gray/black	To right speaker ⊖ terminal.
Green	To left speaker ⊕ terminal.
Green/black	To left speaker ⊖ terminal.

2-speaker system

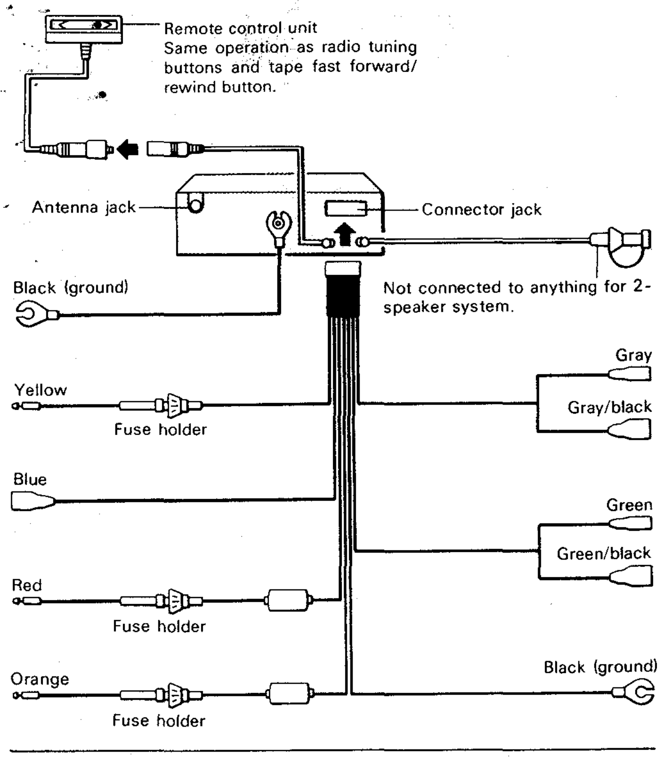

Remote control unit
Same operation as radio tuning buttons and tape fast forward/ rewind button.
Antenna jack
Connector jack
Black (ground)
Not connected to anything for 2-speaker system.
Gray
Gray/black
Yellow
Fuse holder
Blue
Green
Green/black
Red
Fuse holder
Black (ground)
Orange
Fuse holder

Fig. 3

- See the respective power amp owner's manual for detailed wiring (power supply, etc.) information.

Unit leads

Black (ground)	To vehicle (metal) body.
Yellow	To lighting switch terminal.
Blue	To auto-antenna power terminal (Max. 300 mA 12 V DC).
Red	To electric terminal controlled by ignition switch (12 V DC) ON/OFF.
Orange	To terminal always supplied with power regardless of ignition switch position.
Gray	To front/right speaker ⊕ terminal.
Gray/black	To front/right speaker ⊖ terminal.
Green	To front/left speaker ⊕ terminal.
Green/black	To front/left speaker ⊖ terminal.

Power amp leads

Gray	To rear/right speaker ⊕ terminal.
Gray/black	To rear/right speaker ⊖ terminal.
Green	To rear/left speaker ⊕ terminal.
Green/black	To rear/left speaker ⊖ terminal.

4-speaker system

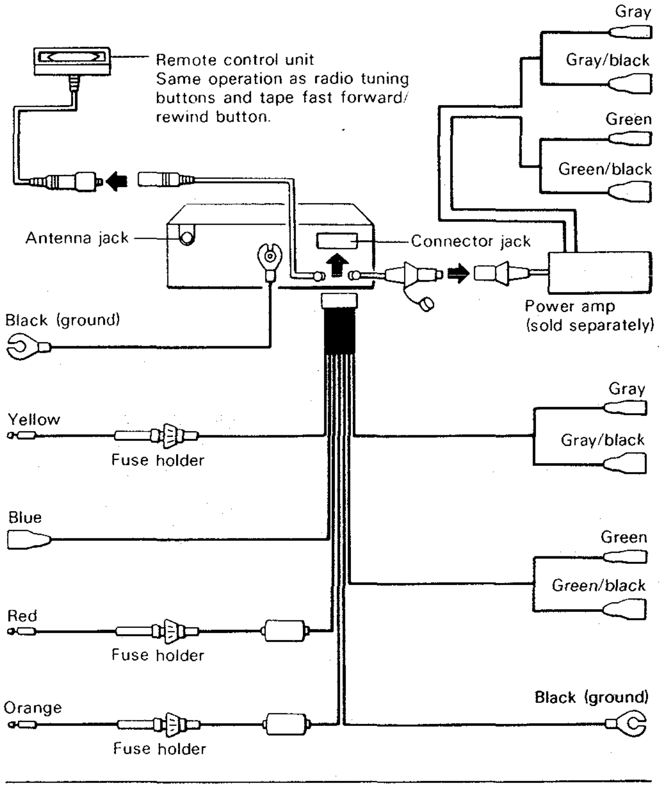

Gray
Remote control unit
Same operation as radio tuning buttons and tape fast forward/ rewind button.
Gray/black
Green
Green/black
Antenna jack
Connector jack
Black (ground)
Power amp (sold separately)
Gray
Yellow
Gray/black
Fuse holder
Blue
Green
Green/black
Red
Fuse holder
Black (ground)
Orange
Fuse holder

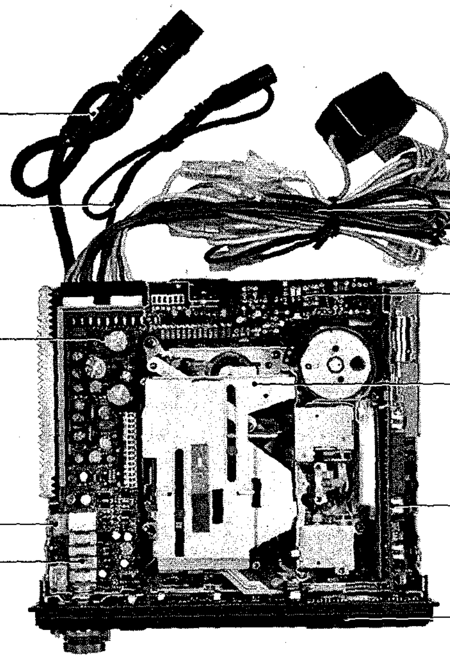
Fig. 4

2. PARTS LOCATIONS

The photo shows the model KEH-9030SDK/WG.

NOTE:

- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*



DIN Connector
CDE1308

Remote Control Cord
CDE1259

Main Amp Unit
◉ CWH1019 (KEH-9030SDK/WG)
◉ CWH1020 (KEH-9030/EW, 9020/G)
◉ CWH1023 (KEH-9020/US, CA)

Switch (LOUDNESS)
★★ CSG-207

Volume/Switch
(VOLUME, BALANCE, POWER SWITCH)
★★ CCS1014

Cord Assy
CDE1278 (KEH-9030SDK/WG)
CDE1279 (KEH-9030/EW, 9020/US, CA, G)

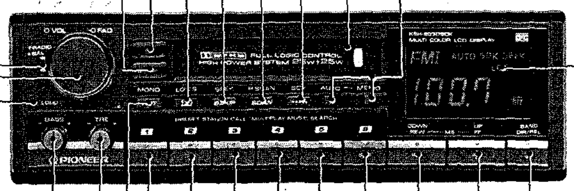
Protective Circuit Unit
◉ CWM1191

Cassette Mechanism Assy
◉ CXK1635

FM Unit
◉ CWE1019 (KEH-9030SDK/WG)
◉ CWE1020 (KEH-9030/EW)
◉ CWE1021 (KEH-9020/US, CA)
◉ CWE1022 (KEH-9020/G)

Grille Unit
CXA1317 (KEH-9020/US, CA, G)
CXA1318 (KEH-9030/EW)
CXA1319 (KEH-9030SDK/WG)

Fig. 1



Button (SCAN)
★ CAC1216

Button (SEEK/BLANK SKIP)
★ CAC1094

Button (LOC. S/DOLBY NR)
★ CAC1095

Button (EJECT)
★ CAC1089

Button (TAPE STBY)
★ CAC1088

Knob (FADER)
★ CAA1046

Knob (VOLUME, BALANCE, POWER SWITCH)
★ CAA-502

Botton Unit
CXA1339

Knob (BASS, TREBLE)
★ CAA1022

Button (MONO/REPEAT)
★ CAC1215

Button (PRESET)
★ CAC1083

Button (KEH-9030/EW)
★ CAC1217
Button (SDK) (KEH-9030SDK/WG)
★ CAC1218
Button (CLOCK) (KEH-9020/US, CA, G)
★ CAC1091

Door
CAT1018 (KEH-9030SDK/WG, 9030/EW)
CAT1037 (KEH-9020/US, CA, G)

Button (AUTO, MEMO)
★ CAC1092

LCD
★ CAW1010 (KEH-9030SDK/WG, 9030/EW)
★ CAW1002 (KEH-9020/US, CA, G)

Button (BAND/DIR/REL)
★ CAC1084

Button (UP/FF)
★ CAC1086

Button (DOWN/REW)
★ CAC1085

Fig. 2

4. OPERATION

• Using the Radio (KEH-9030)

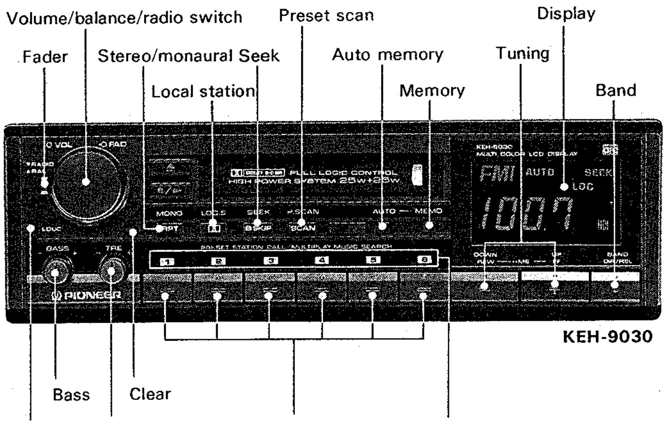


Fig. 5

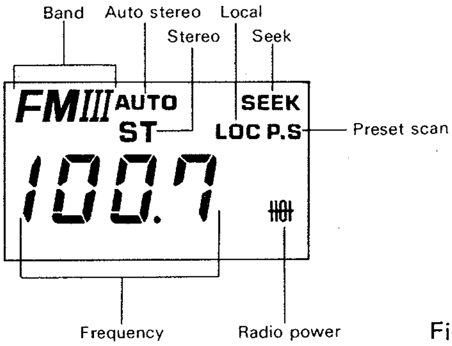


Fig. 6

• Before attempting operation...

- Reduce the volume by turning the volume control knob to the left.
- Set the fader control to the left horizontal.

1. Press the radio switch to turn on power and display the frequency and the radio power indicator.
2. Press the band switch to select the band.

- For units supplied with LW band, switching between FM and MW/LW is controlled by the band switch. Switching between LW and MW is accomplished using the tuning button. The MW band is from 531 kHz to 1,602 kHz, and the LW band is from 153 kHz to 281 kHz.

3. Press the seek button and the seek tuning indicator will be displayed.
4. Press either the left or right side of the tuning button to tune in the desired frequency. (Pressing the right side will increase the frequency.)
5. Adjust the volume and balance.
   To adjust the balance, first pull the knob until a click is heard. After setting to the desired level, push the knob in again to its original position.
6. Adjust the tone.

• To enter a frequency into the preset memory...

7. Press the memory button and the preset number will flash. (approximately 5 seconds)
   Within 5 seconds, press one of the preset buttons (1 – 6) to enter the frequency into the memory. At this time the preset number of the button pressed will illuminate. Six FM1 frequencies, six FM2 frequencies, six FM3 frequencies and six MW and LW frequencies can be entered.

• Auto Memory

The preset button numbers flash (for approximately 5 seconds) when the memory button is pressed. Pressing the auto memory button during this period causes the unit to search upwards from the currently tuned frequency. When receivable broadcasts are found, their broadcast frequencies are automatically assigned to the preset buttons from button 1 through 6. This function is automatically canceled once 6 frequencies are assigned or when the search operation returns to the original frequency from which the search was begun. Using this function while the local station function is ON results in recording of frequencies for relatively strong signals.

• Fader Control

This control is used to adjust the balance between the front and rear speakers when using a 4-speaker system. Turning the control upwards decreases the volume of the rear speakers, while turning it downwards decreases the volume of the front speakers. With 2-speaker systems, set this control to a horizontal position.

• Stereo/Monaural Switch

This switch is used to change from stereo to monaural for FM broadcasts, and is usually left in the stereo position (auto stereo indicator will illuminate on the display). When a stereo broadcast is received, the stereo indicator will illuminate. With the "Automatic Reception Control" (ARC) function, stereo broadcasts can always be enjoyed in their optimal reception mode. If excessive noise is present, pressing this switch allows monaural reception of the broadcast.

• Local Station Switch

Pressing this switch lowers the seek tuning reception sensitivity so that only stronger signals can be tuned in. This feature is convenient when driving through areas that have numerous radio stations. When this switch is depressed, the local indicator will be illuminated on the display.

• Loudness Switch

When playing back a tape or listening to the radio at low volume, the low and high tones are emphasized and more clearly heard by pressing this switch.

Seek Tuning

Press the seek button, and tuning to the next higher or lower broadcast on the band can be accomplished automatically by simply pressing either the left or right side of the tuning button. FM frequencies change in 50 kHz steps while those in the AM (MW) and LW bands change in 9 kHz steps.

• Note on LW Band Seek Tuning

The following shows changes in LW BAND broadcast frequency steps enacted by WARC/1979. The underlined italic figures indicate changes.

A. Up to January 1986
155-164-173-182-191-200-209-218-227-236-245-254-263-272-281

B. From February 1986
153-162-171-180-189 -200-209-218-227-236-245-254-263-272-281

C. From February 1988
153-162-171-180-189-*198-207-216-225-234* -245-254-263-272-281

D. From February 1990
153-162-171-180-189-198-207-216-225-234-*243-252-261-270-279*

The LW BAND SEEK operations of this unit are performed in 9 kHz steps starting from 155 kHz. In the case of B, the change results in the first five frequencies being shifted (2 kHz each) from A, while the remaining ten are identical to those of A. Consequently, manual tuning (in 1 kHz steps) and seek tuning should be used together to tune in the desired LW broadcast. It is also suggested that your favorite LW stations will be memorized for instant recall.

Preset Scan Tuning

Pressing the preset scan button (preset scan indicator will illuminate on the display) causes previously stored frequencies to be tuned in sequentially for eight seconds each (preset number will illuminate). Press again when the desired frequency is tuned in to cancel preset scan tuning.

Preset Tuning

Pressing the preset button instantly tunes in the frequency programmed in the memory for that button.

Manual Tuning

When manual tuning is employed, FM frequencies change in 50 kHz steps, LW frequencies change in 1 kHz steps, and AM (MW) frequencies change in 9 kHz steps.

1. Press the seek button and the seek tuning indicator will disappear from the display.
2. Change the frequency by pressing either the left or right side of the tuning button. Pressing the button once will change the frequency one step (see above). Continuously depressing either side of the button will successively change the frequency at the prescribed step.

•Clear Button

This button is generally used only to correct conditions such as abnormal operation of the built-in microprocessor, power supply failure, failure of the control buttons or an abnormal display. Should such conditions occur, press the clear button with a thin pointed object. This operation deletes the frequencies stored in memory.

• Using the Tape Deck

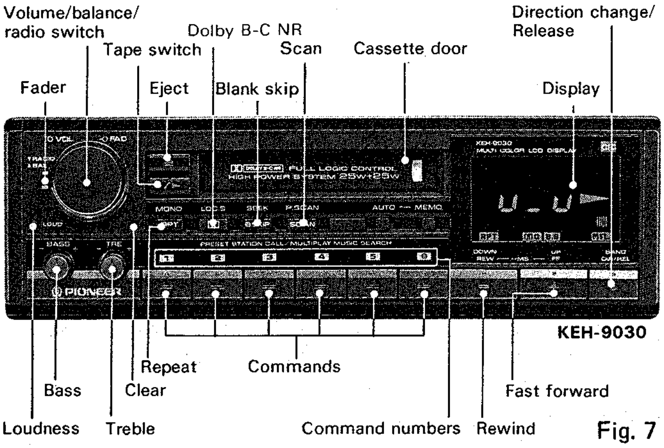


Fig. 7

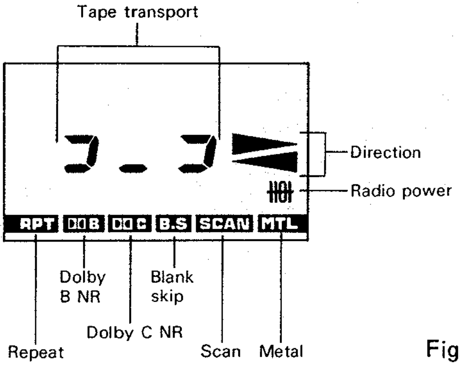


Fig. 8

• Before attempting operation...

- Reduce the volume by turning the volume control knob to the left.
- Set the fader control to the left horizontal.

1. Insert a cassette partway into the tape slot until the mechanism takes over to automatically set the cassette and begin playback. The unit automatically switches over to tape play even if the power of the radio is ON.
2. Adjust the volume and balance.
   To adjust the balance, first pull the knob until a click is heard. After setting to the desired level, push the knob in again to its original position.
3. Adjust the tone.
4. When tape playback reaches the end of the tape, playback will automatically switch from the side being played to the opposite side (ie. Side A to Side B or vice versa) (Auto-reverse). Press the tape switch to stop playback. Pressing this switch again resumes playback from the point at which it was originally stopped.
5. Press the eject button to eject the cassette from the unit.

- Do not try to eject the cassette immediately after insertion, as it will cause malfunction. Wait a few seconds.
- The cassette automatically ejects from the unit if tape setting operations cannot be completed within a few seconds. This may be caused by a faulty or damaged cassette. Try to determine the cause of the problem or use a different cassette.

• Fast Forward/Rewind

Pressing the fast forward button transports the tape forward at high speed. The auto reverse function causes playback to switch automatically from SIDE A to SIDE B (or vice versa) when the end of the tape is reached. Pressing the rewind button rewinds the tape at high speed. The auto replay function causes playback to begin again from the same side of the tape when the beginning of the tape is reached. Both fast forward and rewind are canceled by pressing the release button.

• Direction Change Button

This button is used to switch from one side of the tape to the other (from Side A to Side B or vice versa).

• Auto Tape Selector

The equalizer automatically switches between 70 μs and 120 μs in accordance with the type of tape being used. 70 μs tapes have a hole on the half of the cassette which is detected by the unit. Using a metal or chrome tape causes the metal indicator to appear on the display. Nothing is displayed when normal tapes are used.

• Dolby B-C NR Switch (KEH-9030)

Press to select the proper setting when playing a tape recorded with Dolby NR. Each press of this switch changes the setting in the following sequence: Dolby B NR → Dolby C NR → Dolby NR OFF. The current setting is indicated on the display.

Skip Search

This function allows high speed search for the beginning of a specific selection on a tape. The search range is 5 selections in the rewind direction and 6 selections in the forward direction for a total range of 12 selections (including the current selection).

• Moving back from selection F to selection D

1. Press command button [3] and the number above the button will light for approximately 7 seconds.
2. Pressing the rewind button (−) during this period rewinds the tape to the beginning of selection D (command number [3] flashes), and normal playback resumes.

- Pressing the fast forward button (+) in place of the rewind button advances the tape the number of selections specified by the command button.
- The release button can be used at any time to cancel the skip search function and return to normal playback from that point.

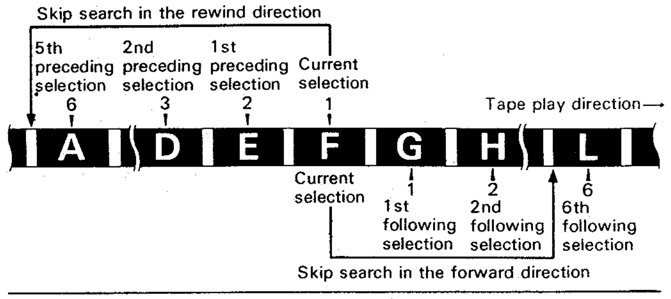


Fig. 9

• Clear Button

This button is generally used only to correct conditions such as abnormal operation of the built-in microprocessor, power supply failure, failure of the control buttons or an abnormal display. Should such conditions occur, press the clear button with a thin pointed object. Performing this operation during tape playback causes playback to stop.

Music Scan

This function is very useful when searching for a specific selection on a tape. The beginning (approximately 9 seconds) of each selection is played back and then unit advances to the next selection at high speed.

1. Press the music scan button (scan indicator appears on display).
2. Pressing the release button cancels music scan and causes normal playback to resume from that point.

Music Search

The music search function can be used to return to the beginning of the current selection or to move ahead to the beginning of the next selection.

• Returning to the beginning of selection F

Simply pressing the rewind button (−) twice causes the number above command button [1] to flash. In a short while, playback automatically resumes from the beginning of the current selection.

- Pressing the fast forward (+) button twice causes playback to move to the beginning of the next selection and resumption of normal playback.
- Pressing the fast forward/rewind button 3 times consecutively returns to normal playback

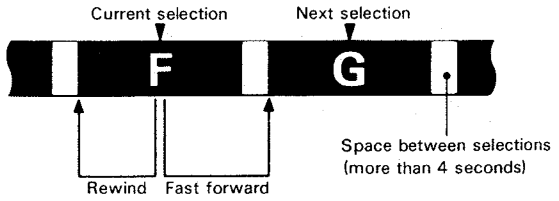


Fig. 10

Music Repeat

The music repeat function causes continuous repeat play of a selection until the function is canceled.

• For example

To repeat selection F, pressing the music repeat button while selection F is playing causes the music repeat indicator to appear on the display. Selection F will repeat from beginning to end until the music repeat function is canceled.

- The release button or music repeat button can be used at any time to cancel the music repeat function and return to normal playback from that point.

• Setting the Time (KEH-9020/US, CA, G)

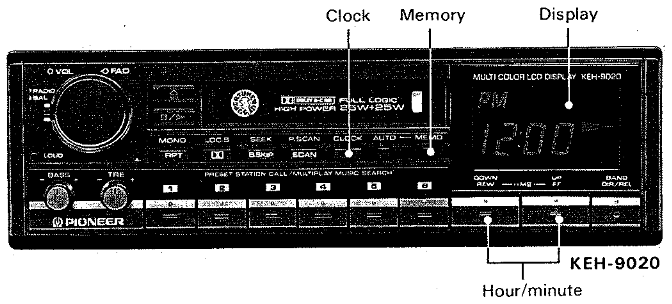


Fig. 11

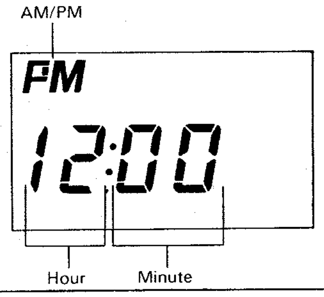


Fig. 12

1. Press the clock switch to switch to the time display.
2. Each press of the left side of the hour/minute control button while holding down the memory button advances hour display by one hour. Each press of the right side advances minute display one minute. Holding down either side of the hour/minute control button advances the respective hour/minute display at high speed.

- When the hour display reaches "12", AM/PM indicator switches.

• Repeating selection F three times

1. Press the music repeat function while selection F (for example) is playing and the music repeat indicator will appear on the display.
2. Press command button [3] (the number above the button lights) and selection F will automatically be repeated three times.

The following situations can result in improper operation of the music scan, skip search, music search and music repeat functions even though the unit is operating properly.

- Unrecorded "blank" portions between selections is less than 4 seconds → the blank portion cannot be detected by the unit.
- Pauses in recorded conversations are longer than 4 seconds → the unit reads these as blanks between selections.
- Portions are recorded at very low volume for more than 4 seconds → the unit reads these as blanks between selections.

• Pre out level switching (KEH-9020/US, CA)

Be sure that the power of the unit is OFF before changing the position of the PRE OUT switch. Failure to do so can cause damage to the speaker because of excessive output.

Set the pre output level to match the power amp input level for 4-speaker system configurations. **Set to 70 mV when a PIONEER power amp is used.**

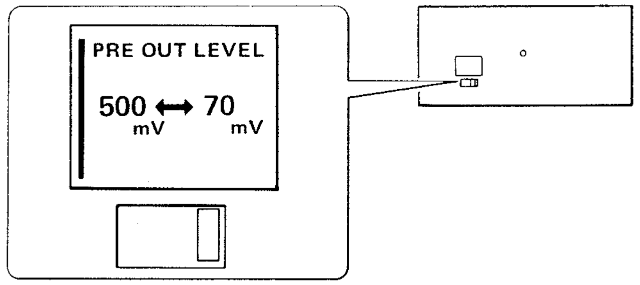


Fig. 13

5. BLOCK DIAGRAM

- **Signal and contorl line (KEH-9030/EW)**

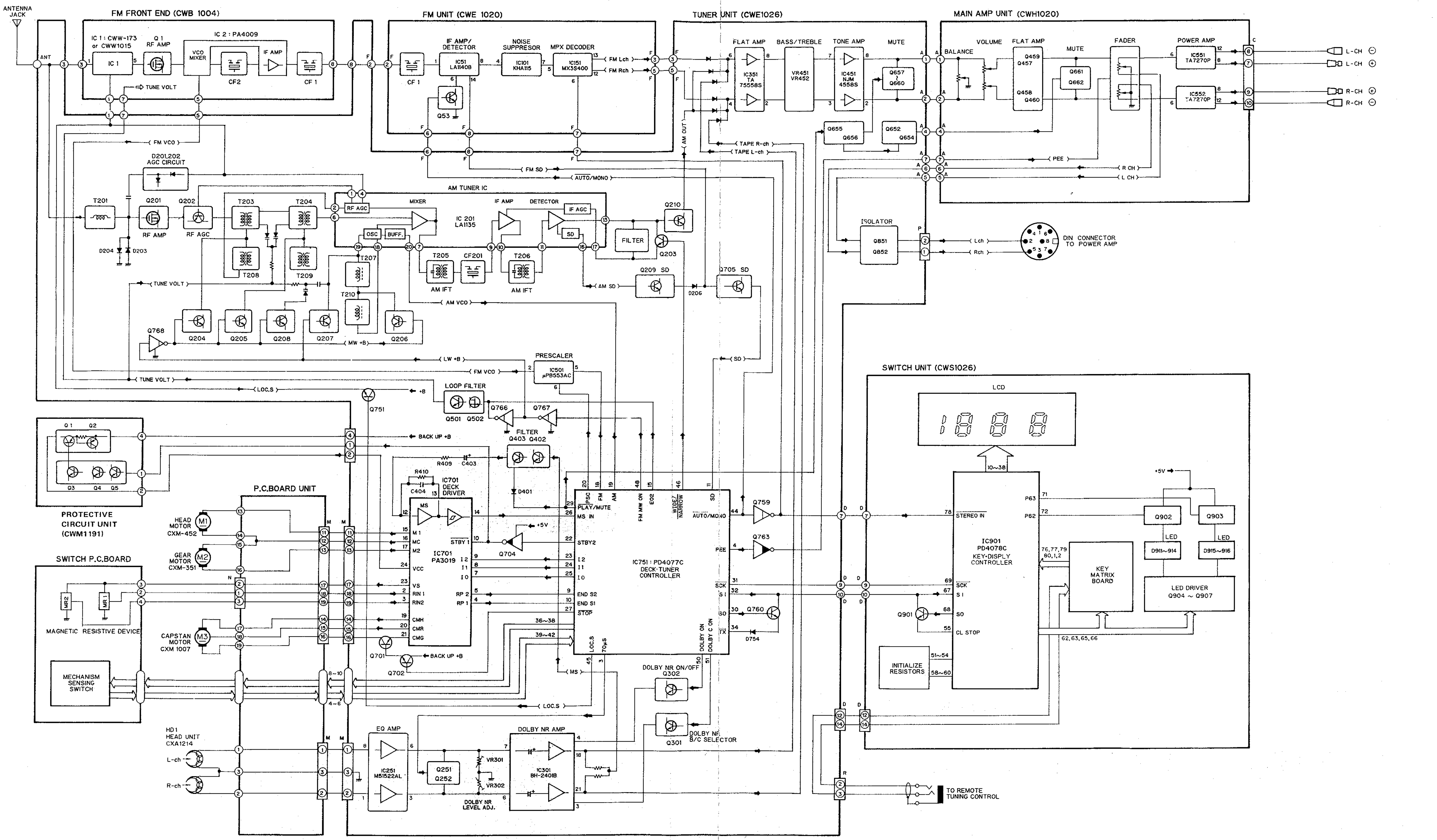

ANTENNA JACK
ANT
FM FRONT END (CWB 1004)
IC 1 : CWW-173 or CWW1015
Q 1 RF AMP
IC 2 : PA4009
VCO MIXER
IF AMP
CF2
CF 1
TUNE VOLT
FM VCO
D201,202 AGC CIRCUIT
FM UNIT (CWE 1020)
IF AMP/ DETECTOR
IC51 LA1140B
NOISE SUPPRESOR
IC101 KHA115
MPX DECODER
IC151 MX3S400
Q53
FM Lch
FM Rch
FM SD
AUTO/MONO
TUNER UNIT (CWE1026)
FLAT AMP
IC351 TA 7555BS
BASS/TREBLE
VR451 VR452
TONE AMP
IC451 NJM 4558S
MUTE
Q657 ~ Q660
Q655 Q656
Q652 Q654
TAPE R-ch
TAPE L-ch
AM OUT
MAIN AMP UNIT (CWH1020)
BALANCE
VOLUME
FLAT AMP
Q459 Q457
Q458 Q460
MUTE
Q661 Q662
FADER
POWER AMP
IC551 TA7270P
IC552 TA7270P
L-CH
R-CH
PEE
R CH
L CH
ISOLATOR
Q851 Q852
Lch
Rch
DIN CONNECTOR TO POWER AMP
AM TUNER IC
T201
Q201 RF AMP
Q202 RF AGC
T203 T204
T208 T209
D204 D203
RF AGC
MIXER
IC 201 LA1135
IF AMP
DETECTOR
IF AGC
OSC
BUFF.
SD
T207
T210
T205 CF201 T206
AM IFT
AM IFT
FILTER
Q210
Q203
Q209 SD
Q705 SD
D206
AM SD
AM VCO
TUNE VOLT
Q768
Q204 Q205 Q208 Q207 Q206
MW +B
LW +B
FM VCO
SD
PRESCALER
IC501 μPB553AC
TUNE VOLT
LOC.S
Q751
+B
LOOP FILTER
Q501 Q502
Q766 Q767
FILTER Q403 Q402
D401
BACK UP +B
Q 1 Q2
Q3 Q4 Q5
PROTECTIVE CIRCUIT UNIT (CWM1191)
P.C.BOARD UNIT
HEAD MOTOR CXM-452
GEAR MOTOR CXM-351
SWITCH P.C.BOARD
MR2 MR1
MAGNETIC RESISTIVE DEVICE
CAPSTAN MOTOR CXM 1007
MECHANISM SENSING SWITCH
R409 C403
R410
C404
IC701 DECK DRIVER
MS
IC701 PA3019
STBY 1
Q704
+5V
VCC
VS RIN 1 RIN2
CMH CMR CMG
RP 2 RP 1
Q701
Q702
BACK UP +B
IC751 : PD4077C DECK·TUNER CONTROLLER
PLAY/MUTE
MS IN
STBY2
END S2
END S1
STOP
AUTO/MONO
PEE
SCK
SI
SO
TX
Q759
Q763
Q760
D754
DOLBY NR ON/OFF Q302
DOLBY NR B/C SELECTOR Q301
MS
LOC.S
HD1 HEAD UNIT CXA1214
L-ch
R-ch
EQ AMP
IC251 M51522AL
Q251 Q252
VR301
VR302
DOLBY NR LEVEL ADJ.
DOLBY NR AMP
IC301 BH-2401B
SWITCH UNIT (CWS1026)
LCD
10~38
IC901 PD4078C KEY·DISPLY CONTROLLER
STEREO IN
SCK
SI
SO
CL STOP
Q901
INITIALIZE RESISTORS
51~54
58~60
P63 P62
+5V
Q902 Q903
LED LED
D911~914 D915~916
KEY MATRIX BOARD
LED DRIVER Q904 ~ Q907
62,63,65,66
TO REMOTE TUNING CONTROL

Fig. 14

- **+B Line (KEH-9030/EW)**

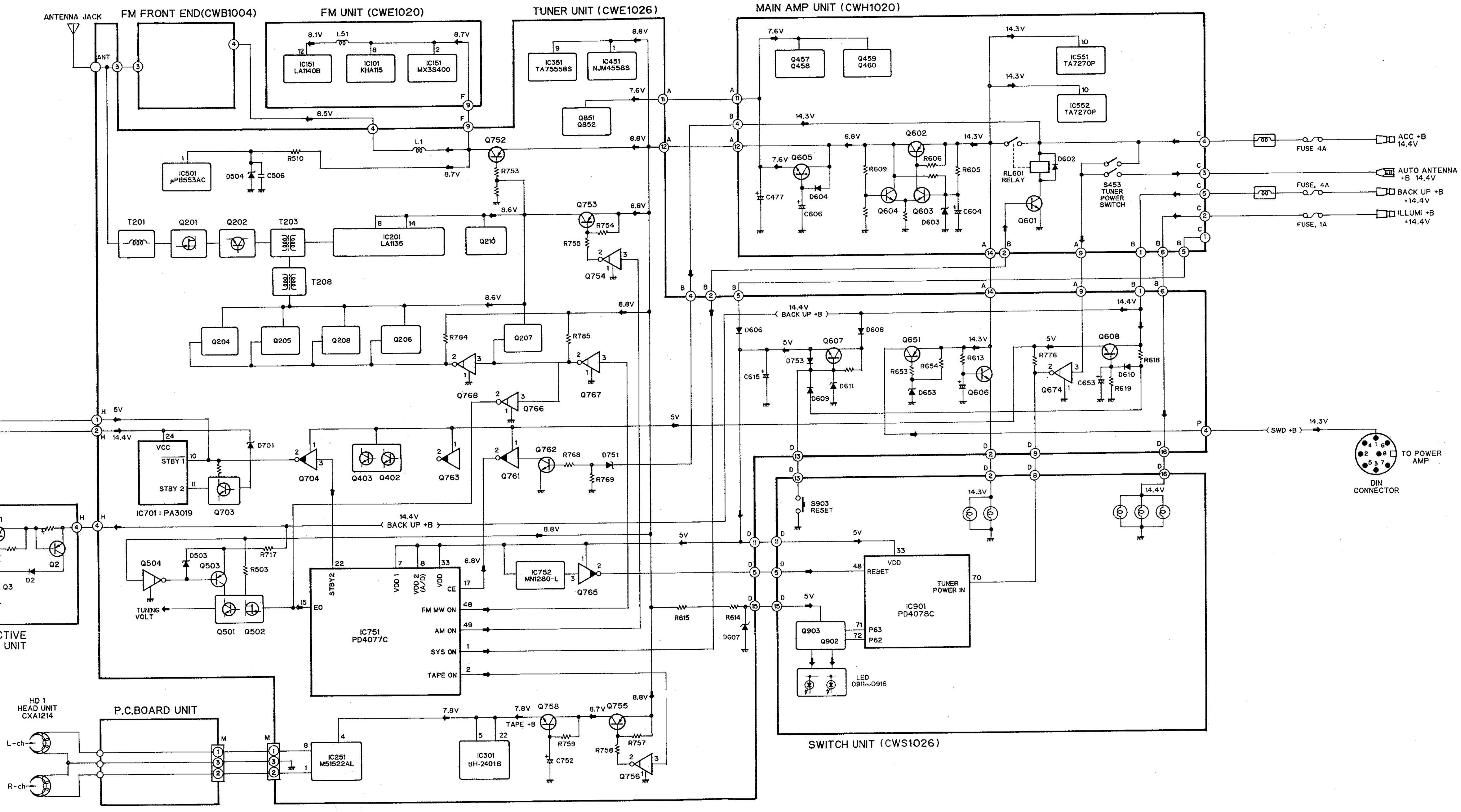

ANTENNA JACK
ANT
FM FRONT END(CWB1004)
FM UNIT (CWE1020)
IC151 LA1140B
IC101 KHA115
IC151 MX3S400
L51
TUNER UNIT (CWE1026)
IC351 TA75558S
IC451 NJM4558S
Q851 Q852
Q752
R753
L1
IC501 μPB553AC
D504
C506
R510
T201
Q201
Q202
T203
T208
IC201 LA1135
Q210
Q753
R754
R755
Q754
Q204
Q205
Q208
Q206
Q207
R784
R785
Q768
Q766
Q767
IC701 : PA3019
VCC
STBY 1
STBY 2
Q703
D701
Q704
Q403 Q402
Q763
Q761
Q762
R768
D751
R769
14.4V BACK UP +B
Q504
D503
Q503
R717
R503
TUNING VOLT
Q501 Q502
IC751 PD4077C
STBY2
VDD 1
VDD 2 (A/D)
CE
EO
FM MW ON
AM ON
SYS ON
TAPE ON
IC752 MN1280-L
Q765
R615
R614
D607
PROTECTIVE CIRCUIT UNIT
Q1
Q2
Q3
D1
D2
HD 1 HEAD UNIT CXA1214
L-ch
R-ch
P.C.BOARD UNIT
IC251 M51522AL
IC301 BH-2401B
TAPE +B
Q758
Q755
R759
C752
R757
R758
Q756
MAIN AMP UNIT (CWH1020)
Q457 Q458
Q459 Q460
IC551 TA7270P
IC552 TA7270P
Q602
Q605
R606
R609
R605
C477
D604
C606
Q604
Q603
D603
C604
Q601
RL601 RELAY
D602
S453 TUNER POWER SWITCH
FUSE 4A
FUSE, 4A
FUSE, 1A
ACC +B 14.4V
AUTO ANTENNA +B 14.4V
BACK UP +B +14.4V
ILLUMI +B +14.4V
14.4V BACK UP +B
D606
D608
Q607
D753
D611
D609
C615
Q651
R613
R653
R654
D653
Q606
Q608
R776
R618
Q674
C653
D610
R619
SWD +B
TO POWER AMP
DIN CONNECTOR
S903 RESET
IC901 PD4078C
VDD
RESET
TUNER POWER IN
Q903
Q902
P63
P62
LED D911~D916
SWITCH UNIT (CWS1026)
5V
14.4V
14.3V
8.8V
8.7V
8.6V
8.5V
8.1V
7.8V
7.6V

Fig. 15

6. LEVEL DIAGRAM

- KEH-9030SDK/WG

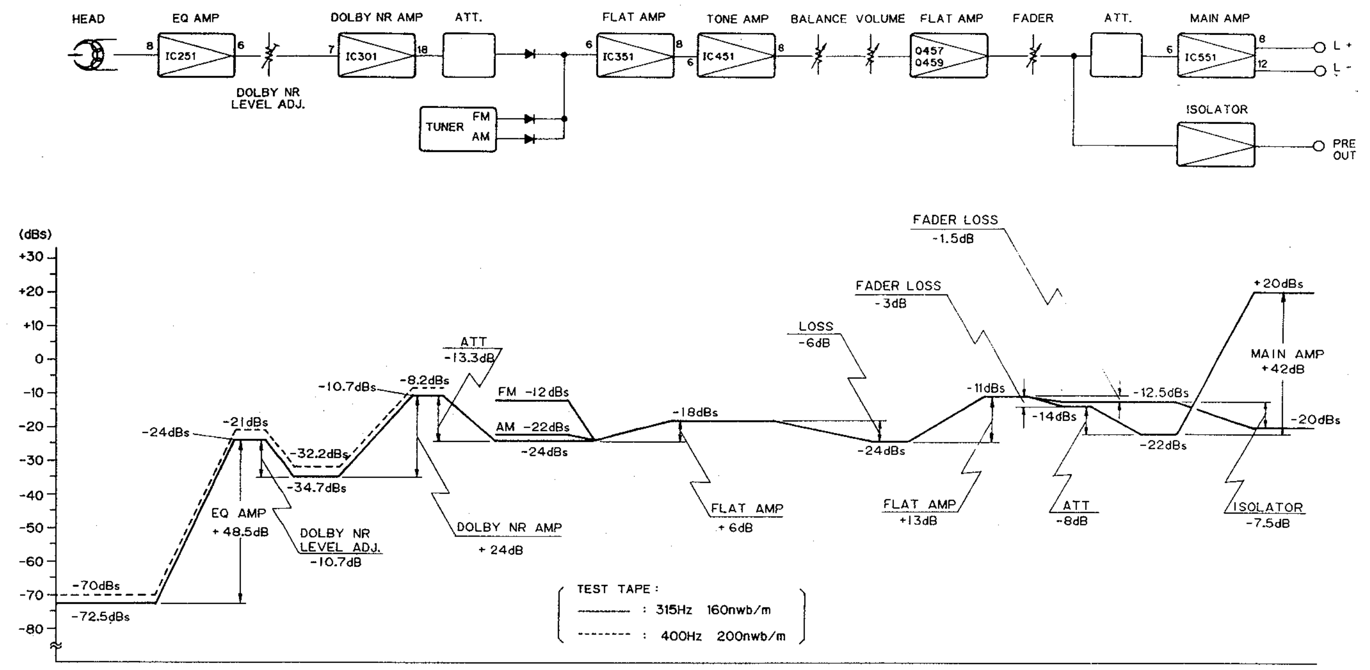

HEAD
EQ AMP
IC251
DOLBY NR LEVEL ADJ.
DOLBY NR AMP
IC301
ATT.
TUNER FM AM
FLAT AMP
IC351
TONE AMP
IC451
BALANCE
VOLUME
FLAT AMP
Q457 Q459
FADER
ATT.
MAIN AMP
IC551
L +
L -
ISOLATOR
PRE OUT
(dBs)
FADER LOSS -1.5dB
FADER LOSS -3dB
LOSS -6dB
ATT -13.3dB
+20dBs
MAIN AMP +42dB
-10.7dBs
-8.2dBs
FM -12dBs
AM -22dBs
-18dBs
-11dBs
-12.5dBs
-14dBs
-20dBs
-24dBs
-21dBs
-32.2dBs
-34.7dBs
-24dBs
-24dBs
-22dBs
EQ AMP +48.5dB
DOLBY NR LEVEL ADJ. -10.7dB
DOLBY NR AMP +24dB
FLAT AMP +6dB
FLAT AMP +13dB
ATT -8dB
ISOLATOR -7.5dB
-70dBs
-72.5dBs
TEST TAPE:
: 315Hz 160nwb/m
: 400Hz 200nwb/m

Fig. 16

- KEH-9030/EW, 9020/G

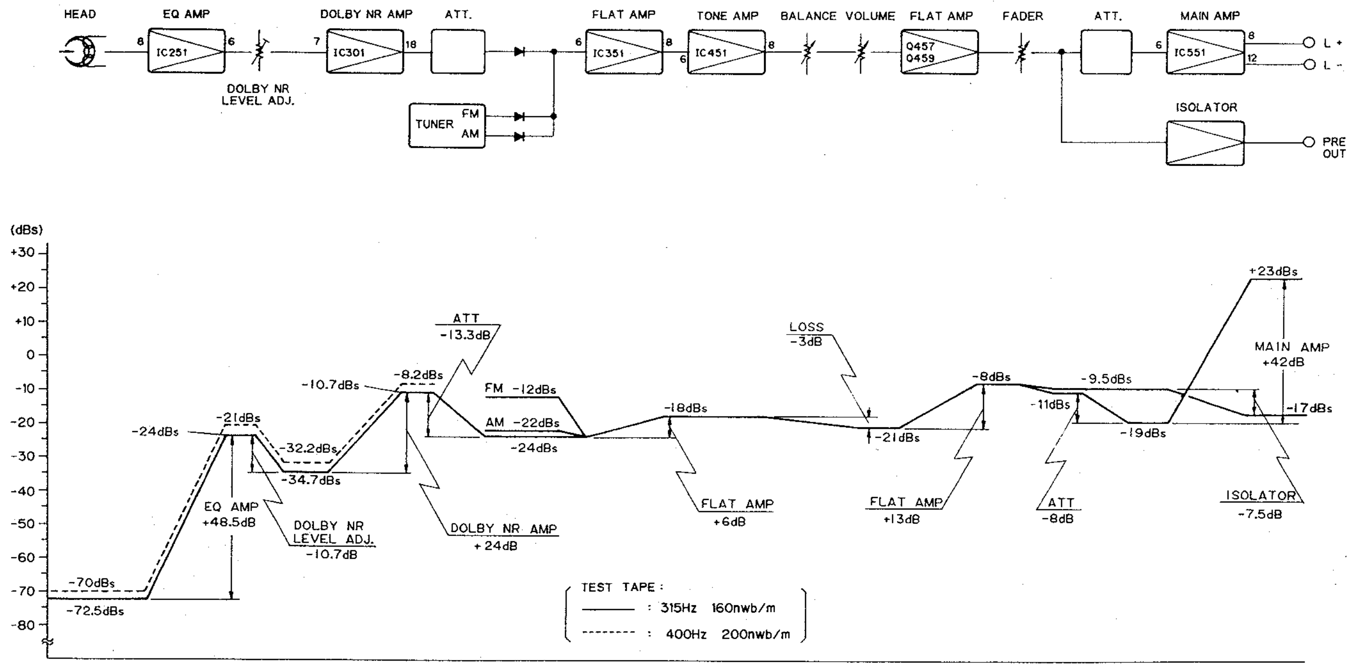

HEAD
EQ AMP
IC251
DOLBY NR LEVEL ADJ.
DOLBY NR AMP
IC301
ATT.
TUNER FM AM
FLAT AMP
IC351
TONE AMP
IC451
BALANCE
VOLUME
FLAT AMP
Q457 Q459
FADER
ATT.
MAIN AMP
IC551
L +
L -
ISOLATOR
PRE OUT
(dBs)
+23dBs
ATT -13.3dB
LOSS -3dB
MAIN AMP +42dB
-10.7dBs
-8.2dBs
FM -12dBs
AM -22dBs
-18dBs
-8dBs
-9.5dBs
-11dBs
-17dBs
-24dBs
-21dBs
-32.2dBs
-34.7dBs
-24dBs
-21dBs
-19dBs
EQ AMP +48.5dB
DOLBY NR LEVEL ADJ. -10.7dB
DOLBY NR AMP +24dB
FLAT AMP +6dB
FLAT AMP +13dB
ATT -8dB
ISOLATOR -7.5dB
-70dBs
-72.5dBs
TEST TAPE:
: 315Hz 160nwb/m
: 400Hz 200nwb/m

Fig. 17

- KEH-9020/US, CA

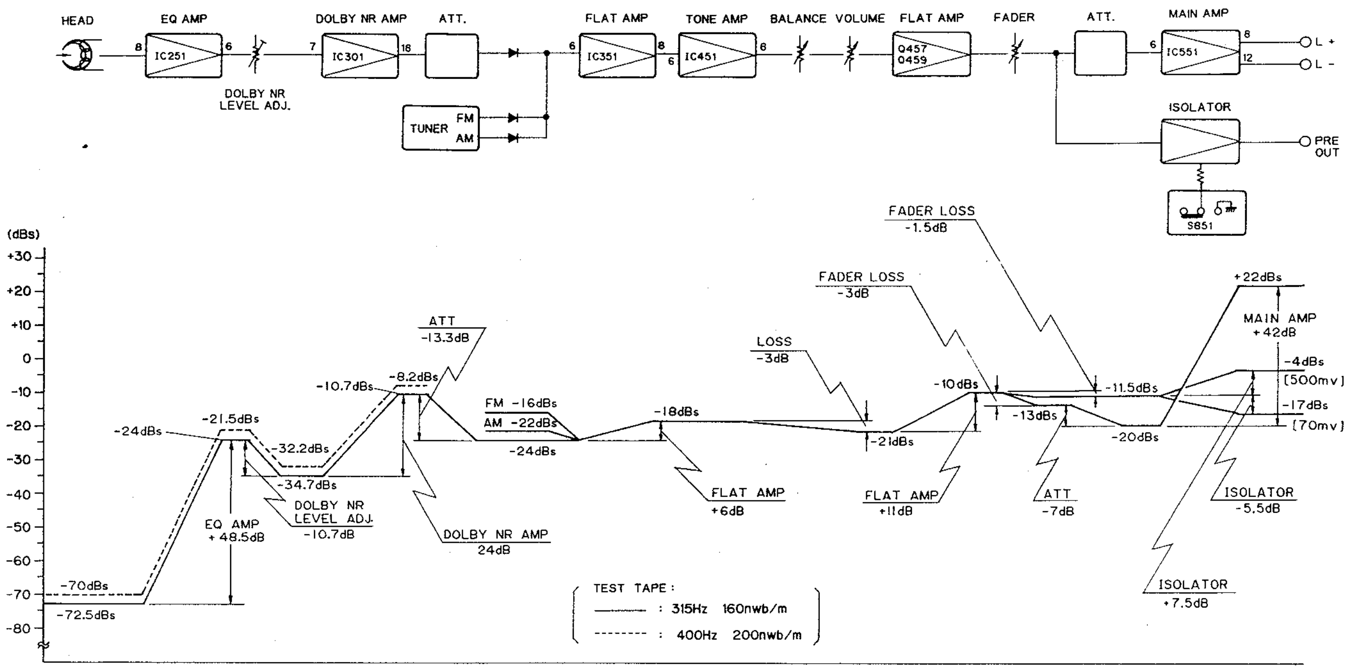
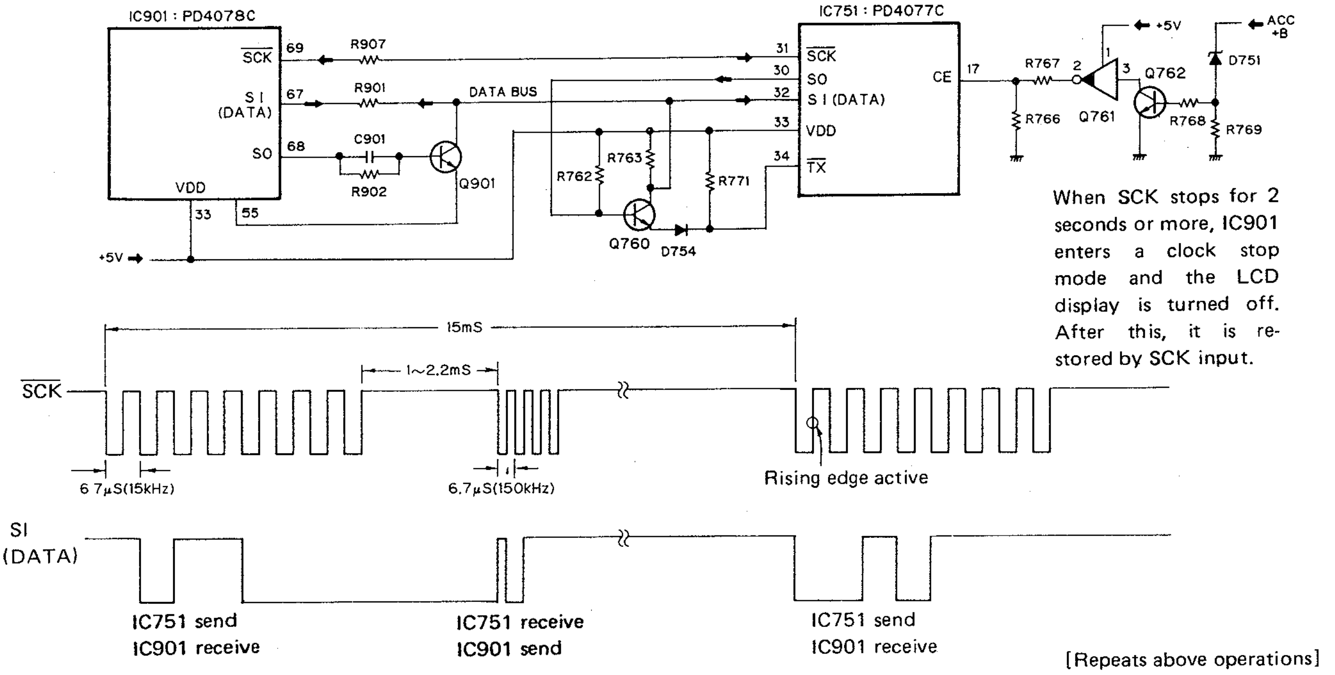

HEAD
EQ AMP
IC251
DOLBY NR LEVEL ADJ.
DOLBY NR AMP
IC301
ATT.
TUNER FM AM
FLAT AMP
IC351
TONE AMP
IC451
BALANCE
VOLUME
FLAT AMP
Q457 Q459
FADER
ATT.
MAIN AMP
IC551
L +
L -
ISOLATOR
PRE OUT
S851
(dBs)
FADER LOSS -1.5dB
FADER LOSS -3dB
LOSS -3dB
ATT -13.3dB
+22dBs
MAIN AMP +42dB
-4dBs [500mv]
-17dBs [70mv]
-10.7dBs
-8.2dBs
FM -16dBs
AM -22dBs
-18dBs
-10dBs
-11.5dBs
-13dBs
-20dBs
-21dBs
-24dBs
-21.5dBs
-32.2dBs
-34.7dBs
-24dBs
EQ AMP +48.5dB
DOLBY NR LEVEL ADJ. -10.7dB
DOLBY NR AMP 24dB
FLAT AMP +6dB
FLAT AMP +11dB
ATT -7dB
ISOLATOR -5.5dB
ISOLATOR +7.5dB
-70dBs
-72.5dBs
TEST TAPE:
: 315Hz 160nwb/m
: 400Hz 200nwb/m

Fig. 18

7. CIRCUIT DESCRIPTION



IC901 : PD4078C
SCK
SI (DATA)
SO
VDD
69
67
68
33
55
R907
R901
C901
R902
Q901
DATA BUS
+5V
IC751 : PD4077C
SCK
SO
S I (DATA)
VDD
TX
CE
31
30
32
33
34
17
R762
R763
R771
Q760
D754
R767
R766
Q761
Q762
R768
R769
D751
+5V
ACC +B
15mS
1~2.2mS
SCK
6 7μS(15kHz)
6.7μS(150kHz)
Rising edge active
SI (DATA)
IC751 send
IC901 receive
IC751 receive
IC901 send
IC751 send
IC901 receive
[Repeats above operations]

When SCK stops for 2 seconds or more, IC901 enters a clock stop mode and the LCD display is turned off. After this, it is restored by SCK input.

IC751 — IC901 communication timimg

Fig. 19

● System Outline

This unit has a 2-chip configuration which connects the deck and tuner controller IC (IC751, PD4077C) to the key display controller IC (IC901, PD4078C) by 8-bit serial data communication. System control for the deck, tuner and muting is performed by IC751.

Key input and LCD display control is performed by IC901. Also, SDK model DK counting (125Hz detection) is performed by IC901.

● Serial Data Communication

When ACC+B is entered, IC751 pin (17) becomes HIGH and 8-bit serial data (condition code) is sent by IC751 pin (30) to start communication.

After this, 8-bit serial data (command code) is sent by IC901 pin (68) to terminate one-time communication.

A set of communication condition and command codes is sent once every 15ms as a response. However, in the first communication after IC751 read reset, condition code is sent with 5ms spacing. After this, the communication spacing becomes 15ms after command code is properly sent back from IC901.

Therefore, if the communication spacing remains constant at 15ms (sometimes 10ms, 20ms during operation), it can be determined that normal communication is performed.

An abnormal communication line is detected by both IC751 and IC901. After an abnormality detection, restart condition code and a restart command are sent in the next communication. Then the system is reset by software to accomplish status and function initialization excluding the clock and preset channel momory.

● Clock Stop

In regard to KEH-9030 SDK/WG, EW, since IC901 pin (51) is set to LOW, quick release occurs after read reset. Two seconds after ACC+B becomes OFF and IC751 pin (17) becomes LOW, the IC751 system clock stops which stops communication. The IC901 system clock stops 2 seconds afterIC751 condition code sending stops in the same way. However, the IC901 system clock stops 2 seconds after communication stops without any relationship to IC901 pin (51) LOW or HITH selection. For example, when the SCK line is cut, the system clock stops 2 seconds after that.

The Q901 emitter is connected to a HIGH terminal during clock stop while the Q760 emitter is connected to a LOW terminal (IC751 pin (34)) through a diode during communication so that current is no consumed by the communication circuit during clock stop.

IC751 pin (34) becomes LOW druing communication and is also proviced with a funciton to prohibit communication during LOW.

• Mute Circuit

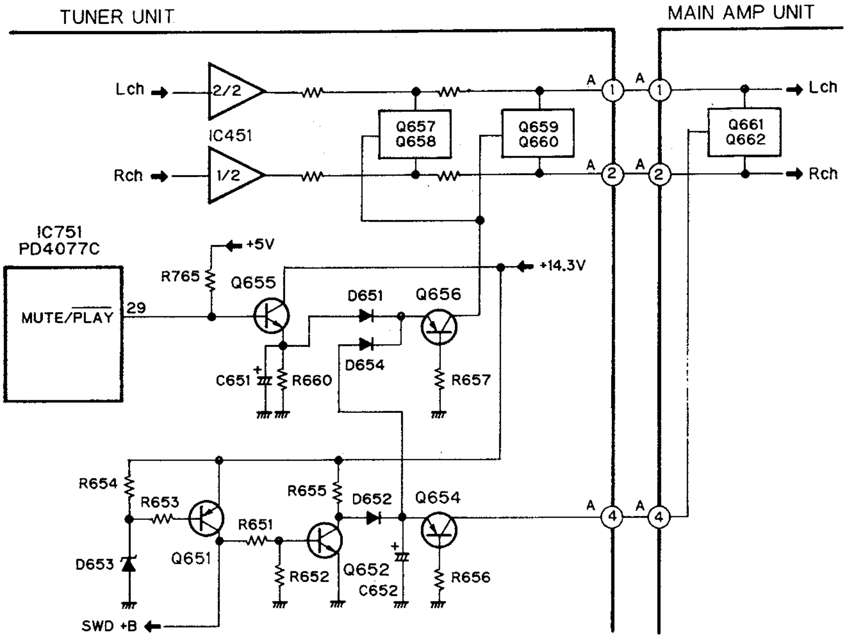

TUNER UNIT
MAIN AMP UNIT
Lch
2/2
IC451
Rch
1/2
Q657
Q658
Q659
Q660
Q661
Q662
A
1
2
4
Lch
Rch
IC751
PD4077C
MUTE/PLAY
29
+5V
R765
Q655
+14.3V
D651
Q656
D654
C651
R660
R657
R654
R653
R655
D652
Q654
R651
D653
Q651
R652
Q652
C652
R656
SWD +B

Fig. 20

• Mute Circuit

1) Microcomputer mute

A Mute signal is provided by MUTE output from IC751 pin (29).

When IC751 pin (29) becomes HIGH, Q655 becomes ON, then Q656 becomes ON and a HIGH is applied to Q657-660 base to apply muting. The return time is delayed by C651.

During Tuner mode

(1) During tuner ON/OFF.
(2) During frequency modulation and operation except that for the preset channel key.
(3) When SDK is ON and no SK station reception occurs (SK mute).
*(4) During DK interruption.

During Tape mode

(1) All timing excluding cassette mechanism play operation.
(2) During overrun compensation in MS operation.
*(3) During DK interruption.

NOTE

* During DK interrupt, mute is applied to the main audio signal line to open another DK dedicated audio signal line.

2) Mute during power supply off

When 14.3V drops to 8.2V, Q651 base current does not flow due to D653 which becomes OFF. When Q652 is turned OFF, Q654 and Q656 are turned ON and HIGH is applied tothe Q657-662 base to perform muting. The return time is delayed by C652.

Reel Unit Rotation Pulse Detection Circuit

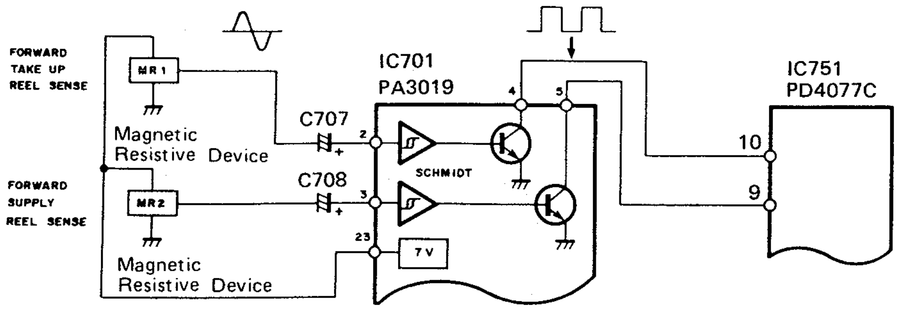

FORWARD TAKE UP REEL SENSE
MR 1
Magnetic Resistive Device
FORWARD SUPPLY REEL SENSE
MR 2
Magnetic Resistive Device
C707
C708
IC701
PA3019
SCHMIDT
7V
2
3
4
5
23
IC751
PD4077C
10
9

Fig. 21

- A continuous-wave is transmitted by the magnetic resistive device (MR 1, MR 2) as the reel unit rotates. This signal is formed into a wave pattern in the Schmitt circuit within IC701, and a square wave is output from pins 4 and 5 (IC701) in synchronization with the rotation of the reel unit. When rotation stops, potential is fixed at 0 or 5 volts.

1. **Tape end detector:** When in the forward play mode, the forward take-up reel is monitored. When in the reverse play mode, the forward supply reel (reverse take-up reel) is monitored. When no pulse is detected for more than 1.2 seconds, the circuit senses that the tape has ended and changes the tape direction.
2. **ATSC:** While rewinding, when rotation of the reel unit on the side from which the tape is being supplied (the take-up side when in the forward play mode) is detected (8 pulses within 600 ms), the deck switches to the play mode.
3. **MS overrun compensator:** When a blank spot on the tape is detected when RMS (rewind music search) is engaged, a stop message is sent to the mechanism, but overrun occurs due to inertia in the cassette and in the reel unit. The length of this overrun (number of revolutions) is monitored, and after switching to the play mode, volume is muted until that length of tape is played. When FMS (fast forward music search) is engaged, the start of the next piece is detected. The deck then switches automatically to RMS, and the actions described above take place.

MS Circuit

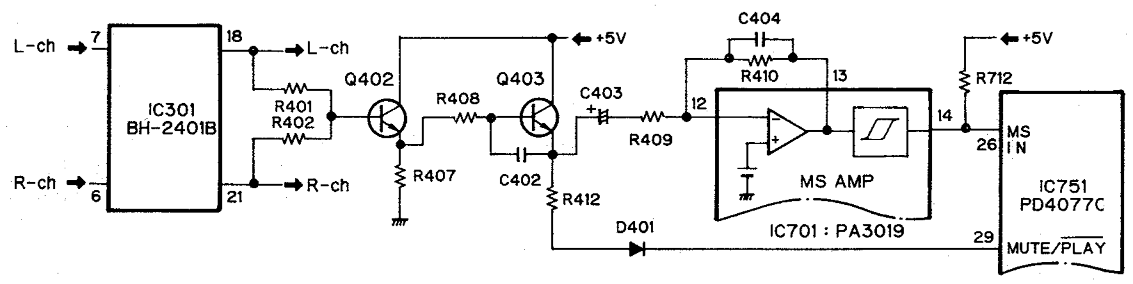

L-ch
R-ch
7
6
18
21
IC301
BH-2401B
L-ch
R-ch
R401
R402
Q402
R407
R408
Q403
C402
R412
C403
R409
+5V
C404
R410
12
13
MS AMP
IC701 : PA3019
D401
14
+5V
R712
26
MS IN
29
IC751
PD4077C
MUTE/PLAY

Fig. 22

The MS circuit detects blank spots on the tape. It consists of a filter, a differential MS amplifier (inside IC701), and a Schmitt comparator (inside IC701). The non-inverted input pin on the MS amplifier is fixed at a standard voltage inside the IC, and the inverted input pin is connected with the outside. The left and right output signals from the Dolby NR circuit are combined and transmitted to pin 12 of IC701 after passing through the filter circuit. Pulses are generated at the output pin of the Schmitt comparator when recorded music exceeds a minimum amplitude. Music selection is then carried out by IC751, which senses these pulses. The filter circuit switches between frequency response and gain when changing from the "Play" music selection mode to the "high speed" music selection mode.

1. **"Play" Music Selection (Equivalent circuit diagram 23):** IC751 pin 29 goes "low", and Q403 go to the "on" position. Since Q403 is acting as an emitter follower at this time, its output impedance is sufficiently low compared with R409. The gain from either the left channel or the right channel to IC701 pin 13 is approximately 45 dB. The low range cut off frequency is approcimately 300 Hz and the high range cut off frequency is approximately 7 kHz.

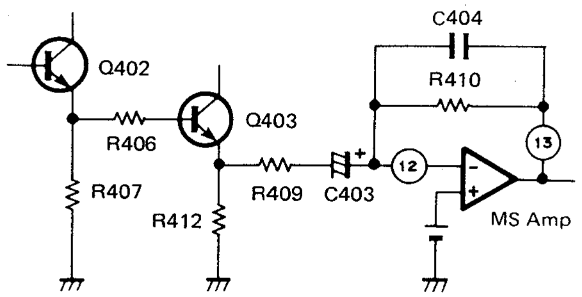

Q402
R406
R407
Q403
R412
R409
C403
C404
R410
12
13
MS Amp

Fig. 23 Equivalent Circuit During "Play" Music Selection (Music Repeat, etc.)

2. **"FF" "REW" Music Selection (Equivalent circuit diagram 24):** IC751 pin 29 goes "high", and Q403 go to "off". At this time, the gain is approximately 37 dB, the low range cut off frequency is approximately 4 kHz and the high range cut off is approximately 7 kHz.

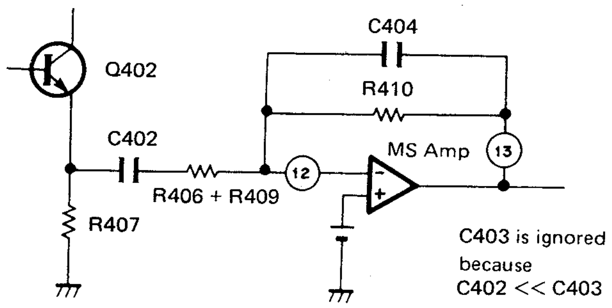

Q402
C402
R406 + R409
R407
C404
R410
12
MS Amp
13
C403 is ignored because C402 << C403

Fig. 24 Equivalent Circuit During the MS Mode

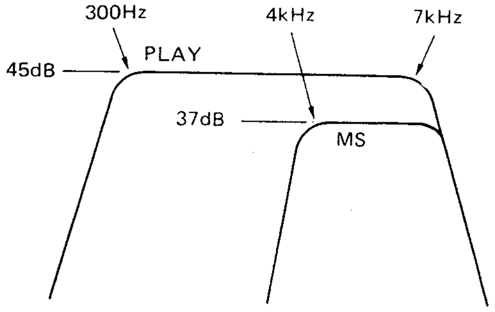


Fig. 25 Filter Characteristics

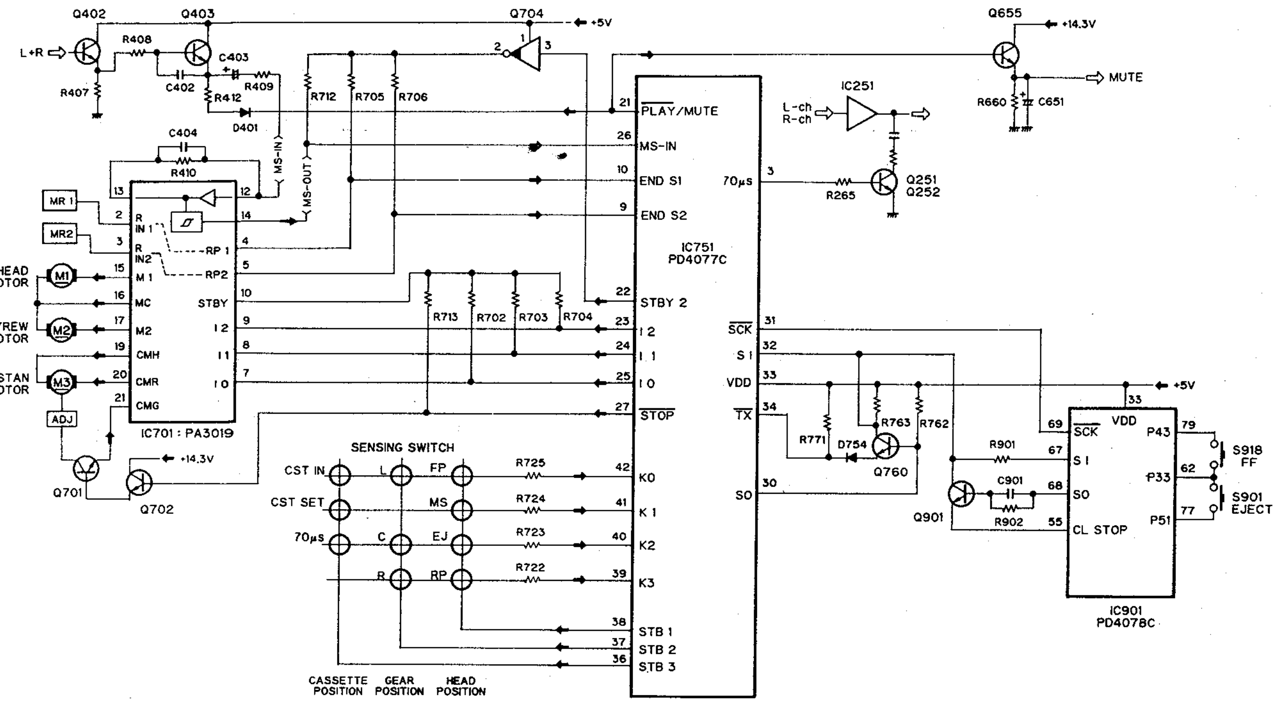

Q402
Q403
Q704
+5V
Q655
+14.3V
MUTE
L+R
R408
C403
R409
R412
C402
R407
D401
R712
R705
R706
C404
R410
MS-IN
MS-OUT
IC251
L-ch
R-ch
R660
C651
Q251
Q252
R265
70μs
PLAY/MUTE
MS-IN
END S1
END S2
IC751
PD4077C
STBY 2
STOP
SCK
SI
VDD
TX
SO
MR 1
MR2
HEAD MOTOR
FF/REW MOTOR
CAPSTAN MOTOR
ADJ
IC701 : PA3019
STBY
R713
R702
R703
R704
R771
D754
R763
R762
Q760
Q701
Q702
SENSING SWITCH
CST IN
CST SET
FP
MS
EJ
RP
R725
R724
R723
R722
K0
K1
K2
K3
STB 1
STB 2
STB 3
CASSETTE POSITION
GEAR POSITION
HEAD POSITION
R901
C901
R902
Q901
CL STOP
P43
P33
P51
IC901
PD4078C
S918 FF
S901 EJECT

Fig. 26

• Location of Cassette Mechanism Assy

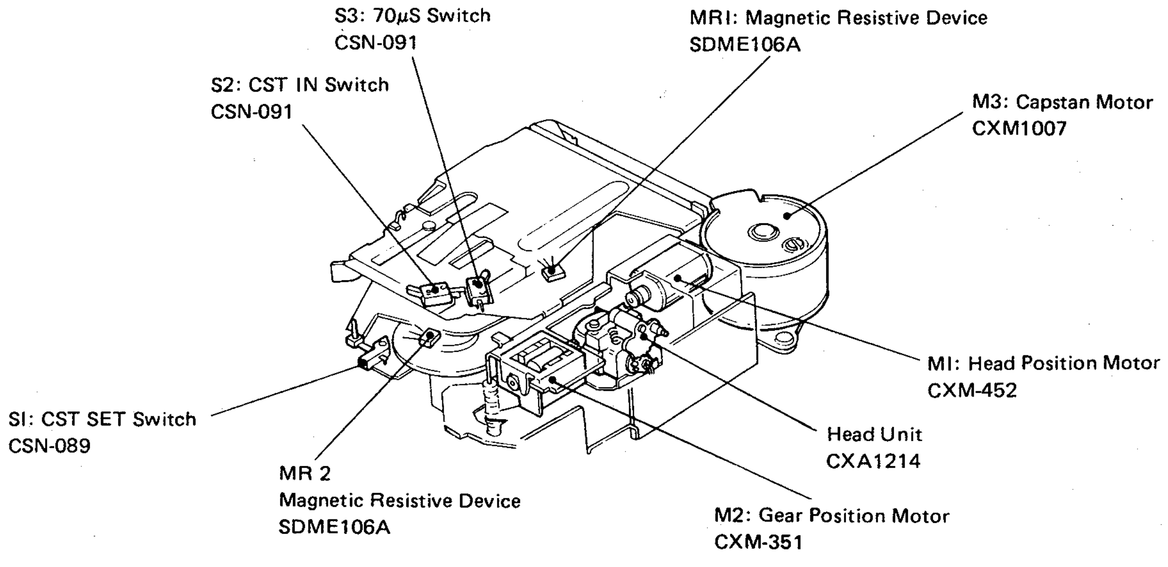
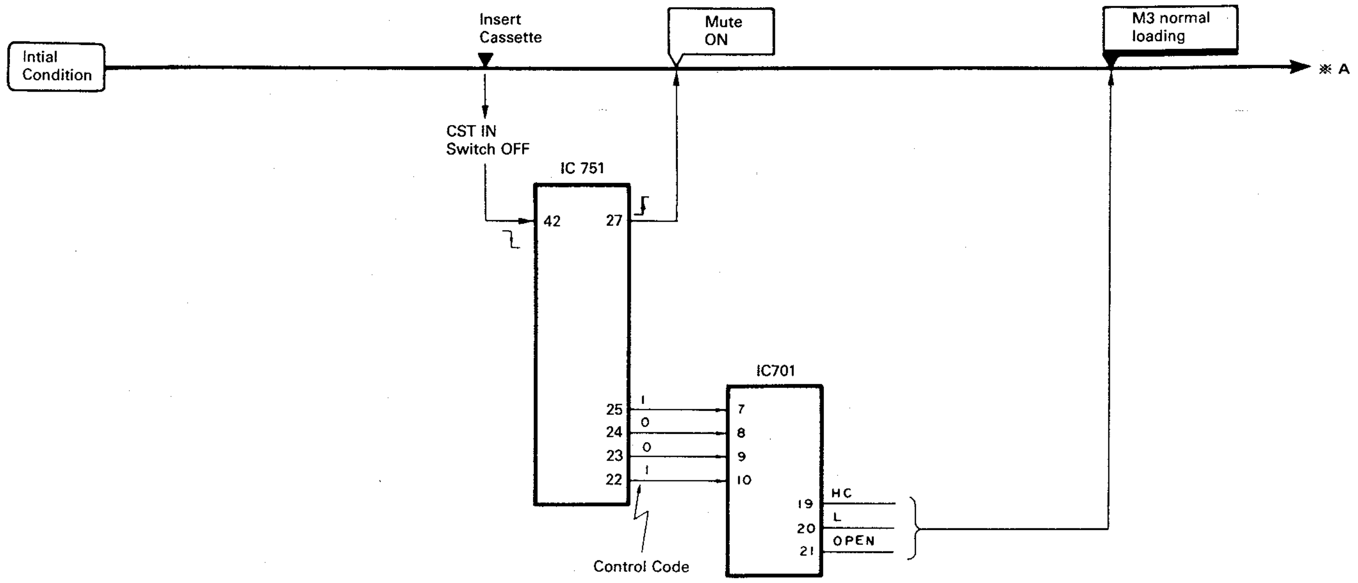
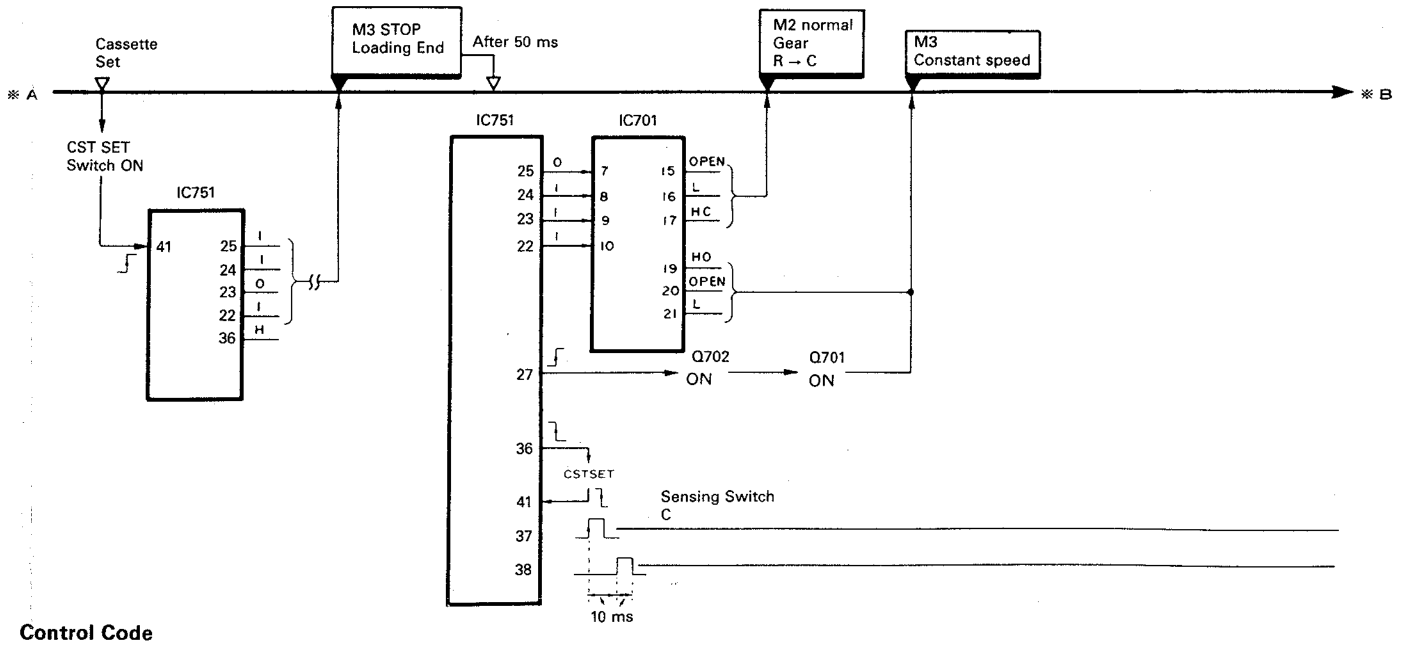

S3: 70μS Switch
CSN-091
S2: CST IN Switch
CSN-091
MRI: Magnetic Resistive Device
SDME106A
M3: Capstan Motor
CXM1007
MI: Head Position Motor
CXM-452
Head Unit
CXA1214
M2: Gear Position Motor
CXM-351
SI: CST SET Switch
CSN-089
MR 2
Magnetic Resistive Device
SDME106A

Fig. 27

• Operation (shown in Fig. 26)

1. Insert Cassette Tape


Intial Condition
Insert Cassette
Mute ON
M3 normal loading
※A
CST IN Switch OFF
IC 751
42
27
IC701
25
24
23
22
7
8
9
10
19
20
21
HC
L
OPEN
Control Code

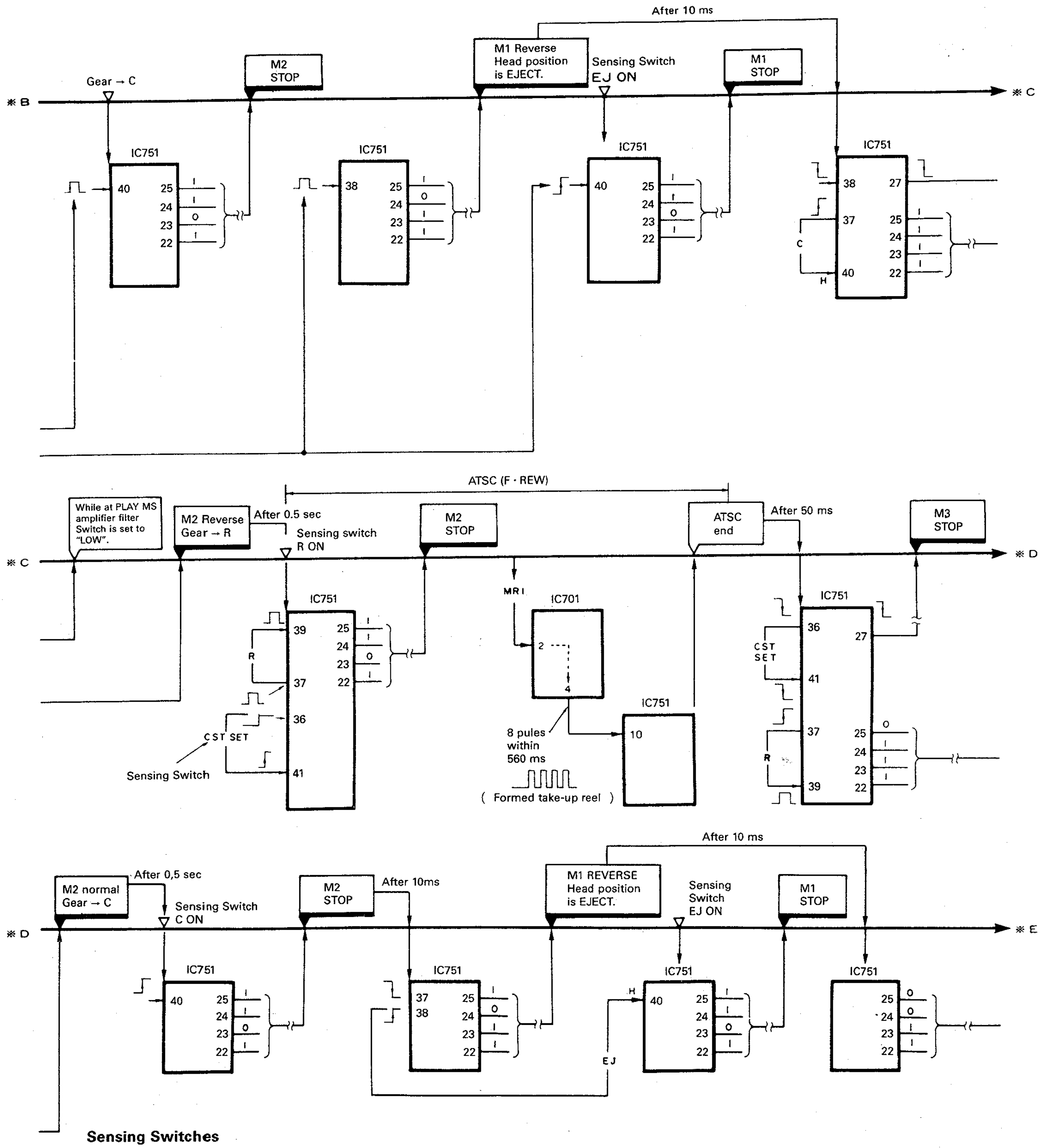

※A
Cassette Set
M3 STOP Loading End
After 50 ms
M2 normal Gear R → C
M3 Constant speed
※B
CST SET Switch ON
IC751
41
IC751
IC701
OPEN
L
HC
HO
OPEN
L
Q702 ON
Q701 ON
CSTSET
Sensing Switch C
10 ms

Control Code

IC751: PD4077C — IC701: PA3019

Control Mode		Control Code				Mechanism Operation	Output Terminal Voltage					
		25	24	23	22		19	20	21	15	16	17
Output OFF		0	0	0	0	Release	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN
M3 (CM)	Normal	1	0	0	1	Loading	HC	L	↑	↑	↑	↑
	Reverse	0	1	0	1	Eject	L	HC	↑	↑	↑	↑
	Constant speed	1	1	0	1	PLAY, FF, REW or MS	HO	OPEN	L	↑	↑	↑
M1	Normal	0	0	1	1	HEAD EJ → FP	↑	↑	↑	HC	L	↑
	Reverse	1	0	1	1	HEAD EJ → RP	↑	↑	↑	L	HC	↑
M2	Normal	0	1	1	1	Gear direction: R → L	↑	↑	↑	OPEN	L	HC
	Reverse	1	1	1	1	Gear direction: L → R	↑	↑	↑	↑	HC	L

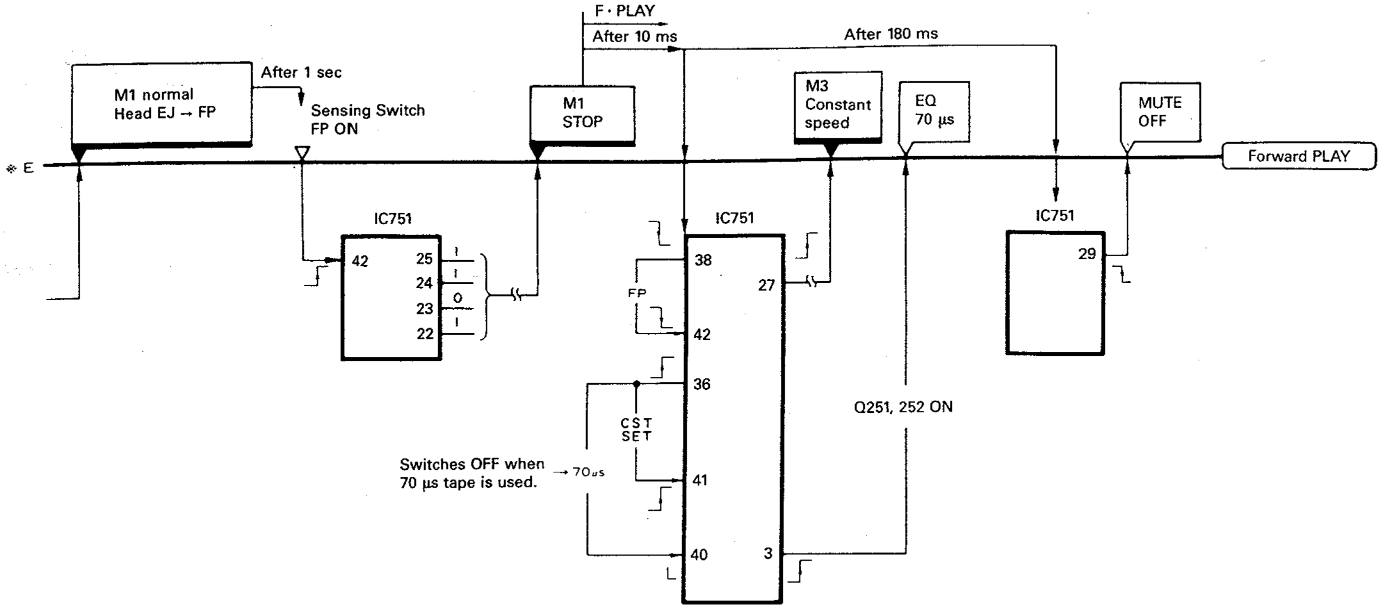
*Output terminal voltage
HC ...... Approx. 7V HO ...... Vcc—1.7V OPEN ...... High impedance L 0V


※B
Gear → C
M2 STOP
IC751
40
25
24
23
22
M1 Reverse Head position is EJECT.
After 10 ms
Sensing Switch EJ ON
M1 STOP
38
37
27
C
H
※C
While at PLAY MS amplifier filter Switch is set to "LOW".
M2 Reverse Gear → R
After 0.5 sec
Sensing switch R ON
ATSC (F · REW)
M2 STOP
ATSC end
After 50 ms
M3 STOP
※D
39
R
36
41
CST SET
Sensing Switch
MRI
IC701
2
4
8 pules within 560 ms
(Formed take-up reel)
10
M2 normal Gear → C
After 0,5 sec
Sensing Switch C ON
After 10ms
M1 REVERSE Head position is EJECT.
Sensing Switch EJ ON
EJ
※E

Sensing Switches

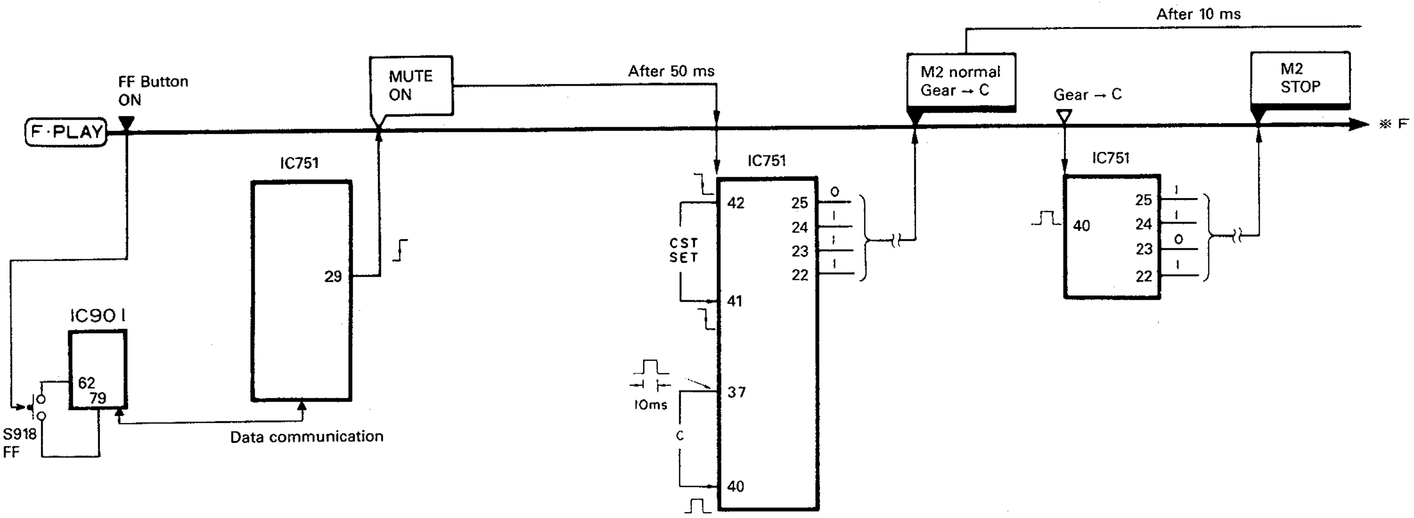
	Switch	Function
Cassette Position	CST IN	Turned OFF when a cassette tape is inserted.
	CST SET	Turned ON when the cassette tape is set in position.
	70μs	Turned OFF when a 70μs cassette tape is inserted.
FF/REW Gear Position	L	FF in FWD (normal) and REW in REV.
	C	Eject or Play
	R	REW in FWD (normal) and FF in REV.

	Function	Switch
Head Position	FWD PLAY	FP
	MS	MS
	Eject	EJ
	REV PLAY	RP

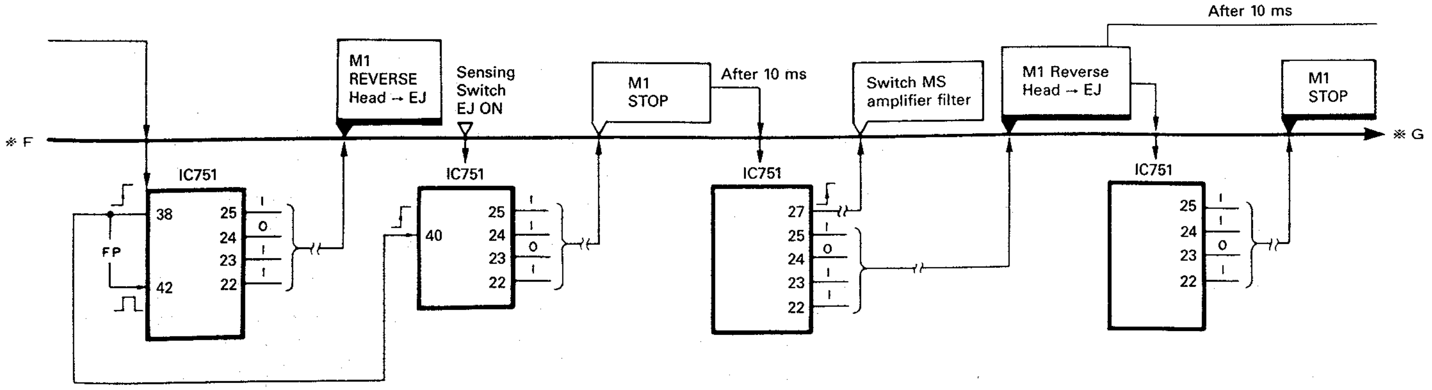


※ E
M1 normal
Head EJ → FP
After 1 sec
Sensing Switch
FP ON
IC751
42
25
24
23
22
1
1
0
1
F · PLAY
After 10 ms
M1
STOP
After 180 ms
M3
Constant
speed
EQ
70 µs
MUTE
OFF
Forward PLAY
IC751
38
FP
42
36
CST
SET
41
40
27
3
Switches OFF when
70 µs tape is used.
→ 70µs
Q251, 252 ON
IC751
29

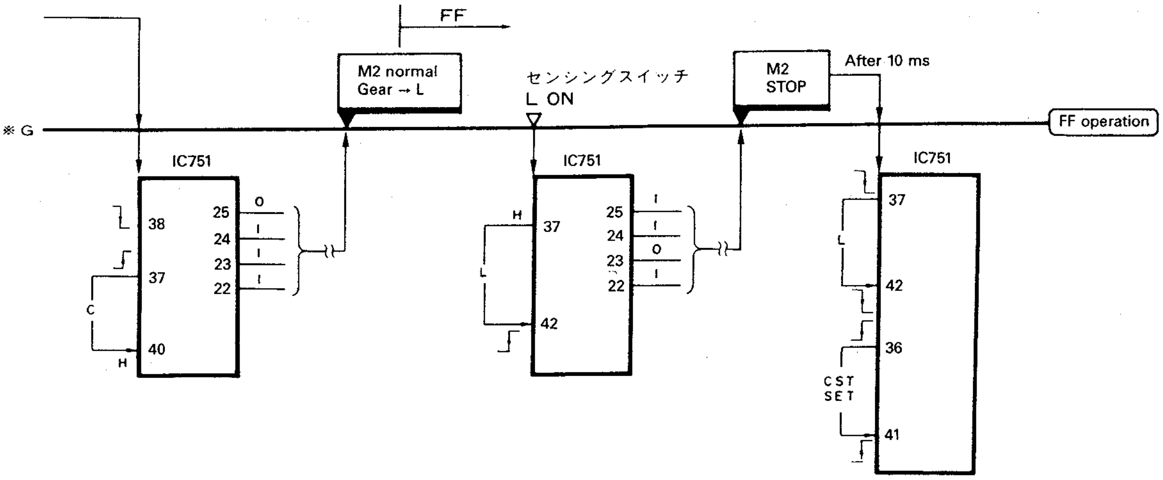
2. F · PLAY → FF



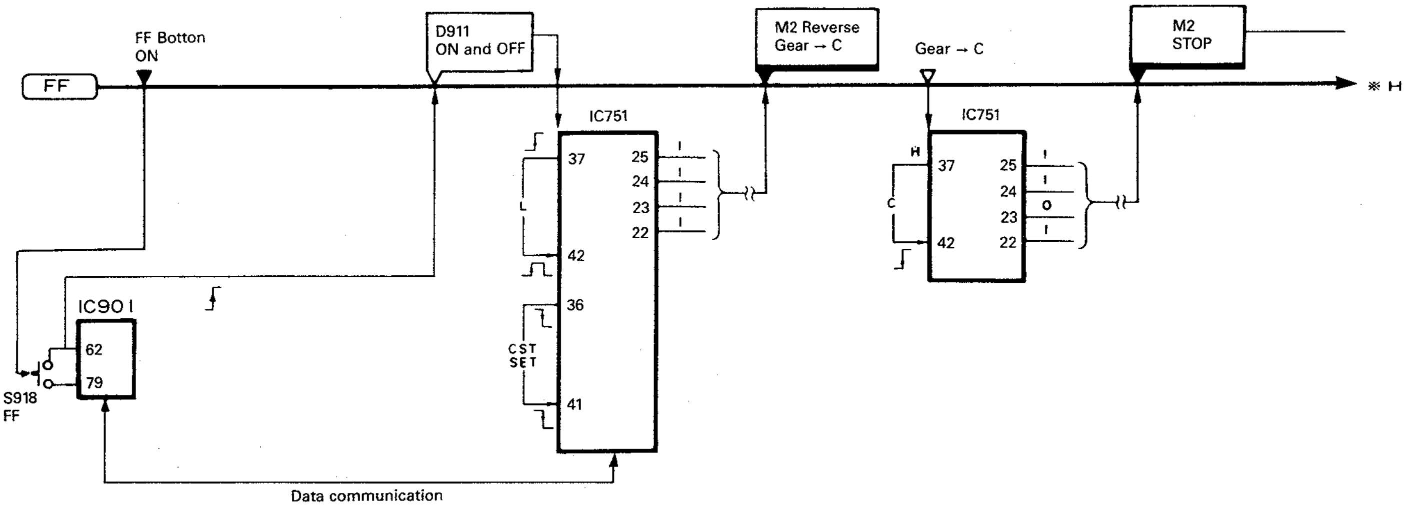
F · PLAY
FF Button
ON
MUTE
ON
IC751
29
IC90 I
62
79
S918
FF
Data communication
After 50 ms
IC751
42
CST
SET
41
37
10ms
C
40
25
24
23
22
0
1
1
1
After 10 ms
M2 normal
Gear → C
Gear → C
IC751
40
25
24
23
22
1
1
0
1
M2
STOP
※ F

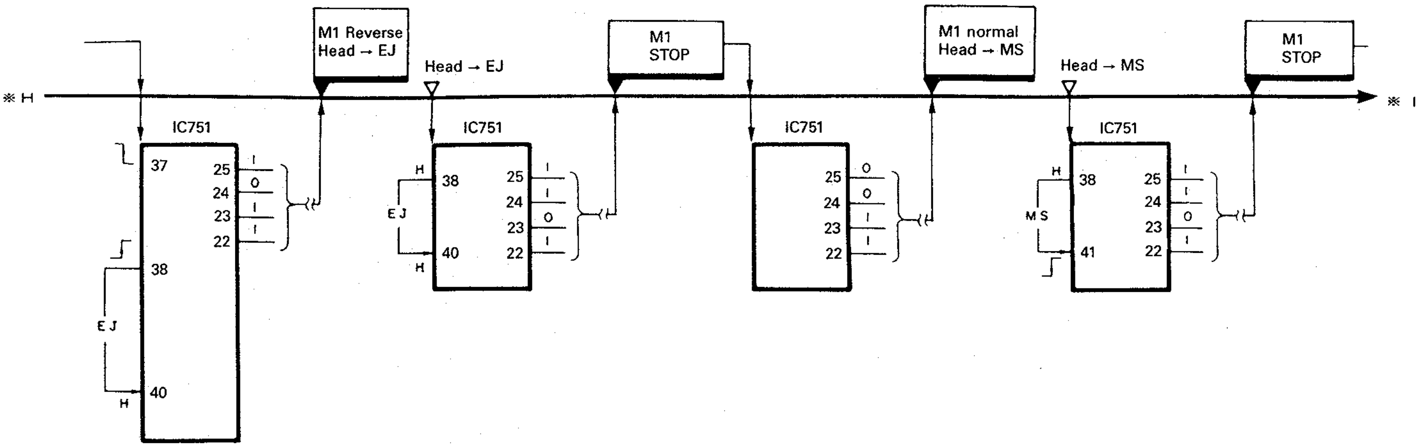


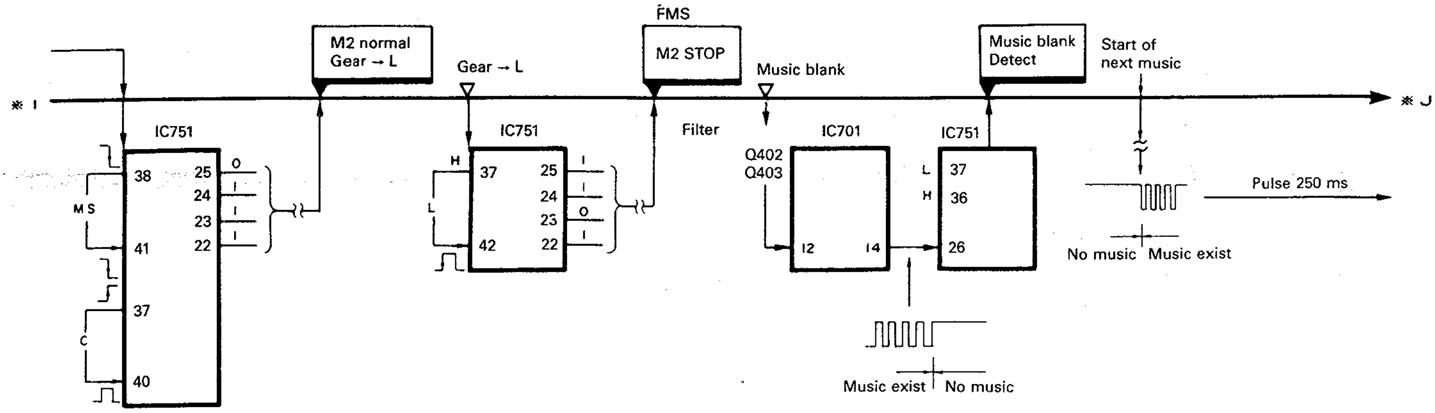
※ F
IC751
FP
M1
REVERSE
Head → EJ
Sensing
Switch
EJ ON
IC751
M1
STOP
After 10 ms
IC751
Switch MS
amplifier filter
M1 Reverse
Head → EJ
After 10 ms
IC751
M1
STOP
※ G

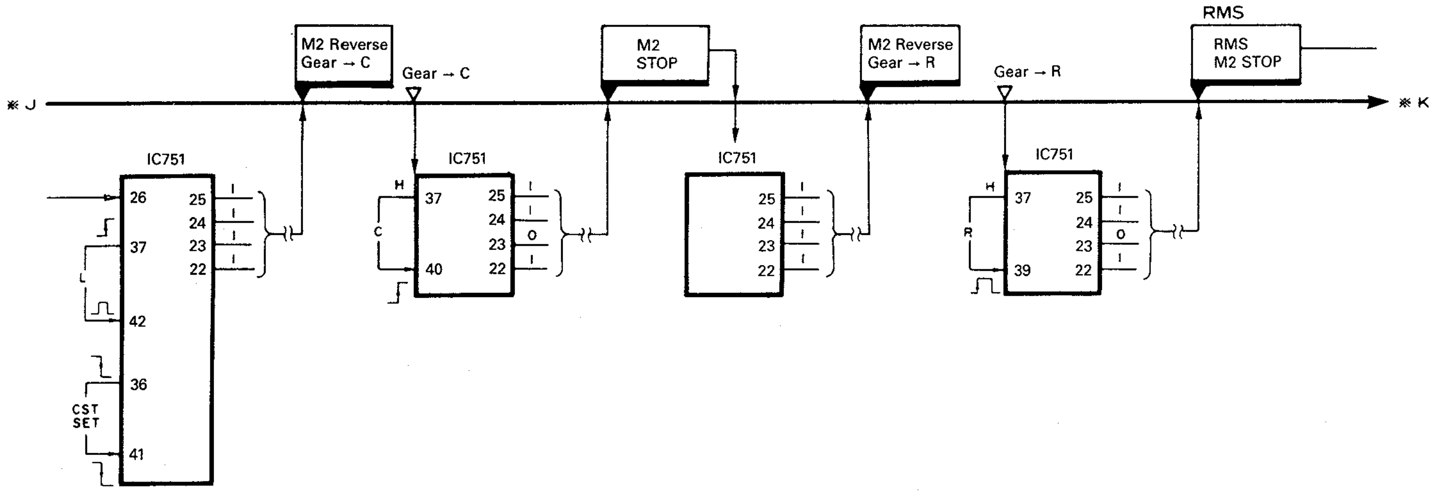

FF
M2 normal
Gear → L
センシングスイッチ
L ON
M2
STOP
After 10 ms
※ G
FF operation
IC751
38
37
40
C
H
25
24
23
22
O
I
I
I
IC751
H
37
L
42
25
24
23
22
I
I
O
I
IC751
37
L
42
36
CST
SET
41

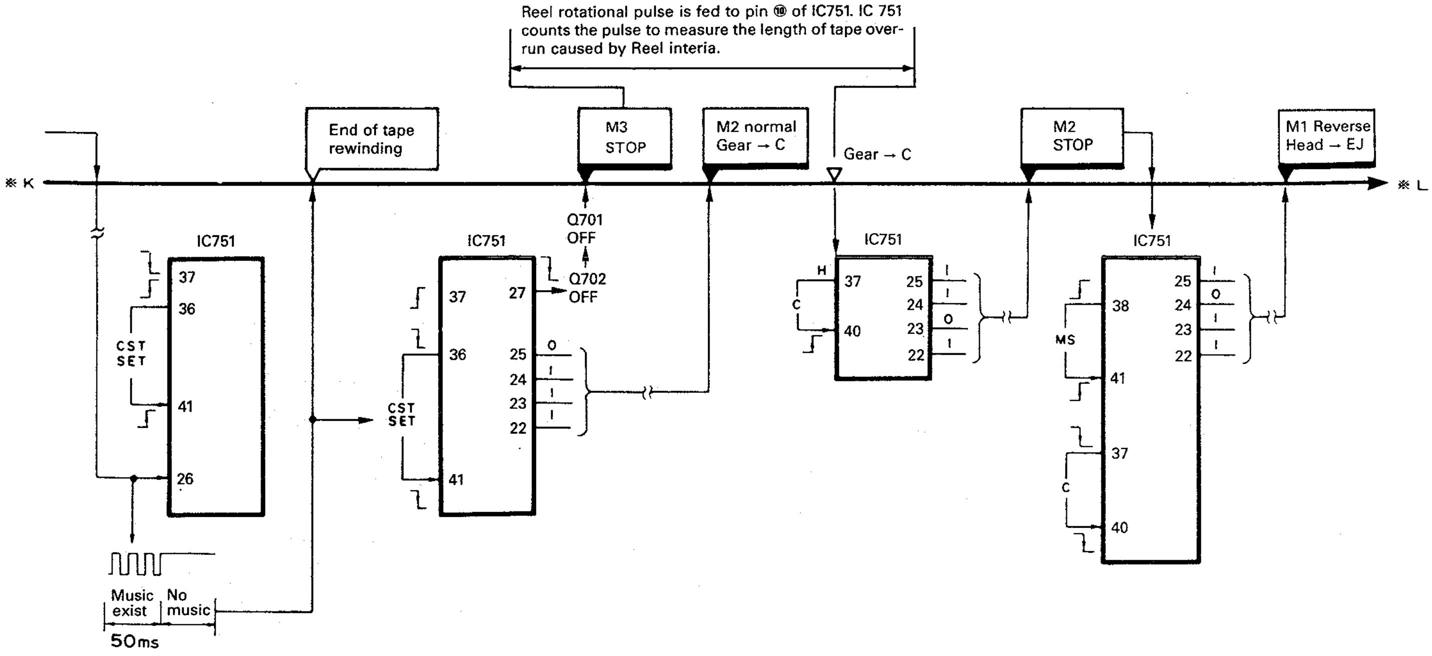
3. FF → F · MS


FF Botton
ON
FF
D911
ON and OFF
M2 Reverse
Gear → C
Gear → C
M2
STOP
※ H
IC751
37
L
42
36
CST
SET
41
25
24
23
22
I
I
I
I
IC751
H
37
C
42
25
24
23
22
I
I
O
I
IC90 I
62
79
S918
FF
Data communication

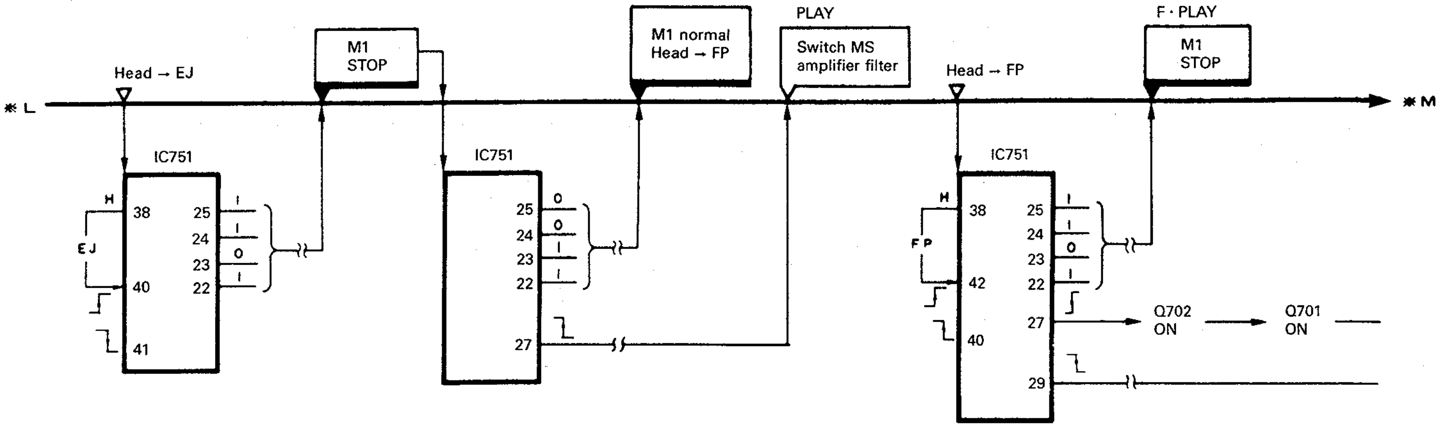

※ H
M1 Reverse
Head → EJ
Head → EJ
M1
STOP
M1 normal
Head → MS
Head → MS
M1
STOP
※ I
IC751
37
38
EJ
40
H
25
24
23
22
I
O
I
I
IC751
H
38
EJ
40
H
25
24
23
22
I
I
O
I
IC751
25
24
23
22
O
O
I
I
IC751
H
38
MS
41
25
24
23
22
I
I
O
I

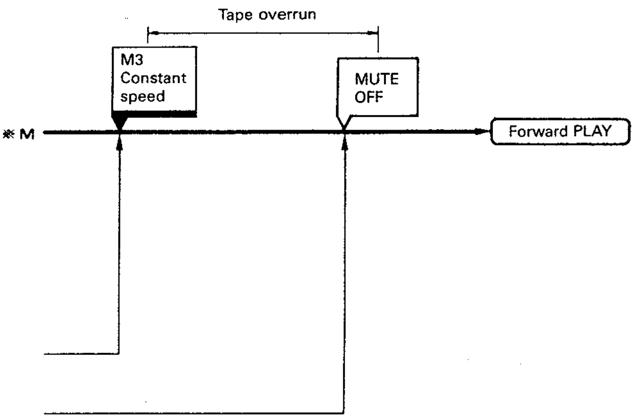

※ I
M2 normal Gear → L
Gear → L
FMS
M2 STOP
Music blank
Filter
Music blank Detect
Start of next music
※ J
IC751
38
25
24
23
22
O
I
I
I
MS
41
37
C
40
IC751
H
37
L
42
25
24
23
22
I
I
O
I
Q402
Q403
IC701
12
14
IC751
L
37
H
36
26
Pulse 250 ms
No music
Music exist
Music exist
No music


※ J
M2 Reverse Gear → C
Gear → C
M2 STOP
M2 Reverse Gear → R
Gear → R
RMS
RMS M2 STOP
※ K
IC751
26
25
24
23
22
I
I
I
I
37
L
42
36
CST SET
41
IC751
H
37
C
40
25
24
23
22
I
I
O
I
IC751
25
24
23
22
I
I
I
I
IC751
H
37
R
39
25
24
23
22
I
I
O
I

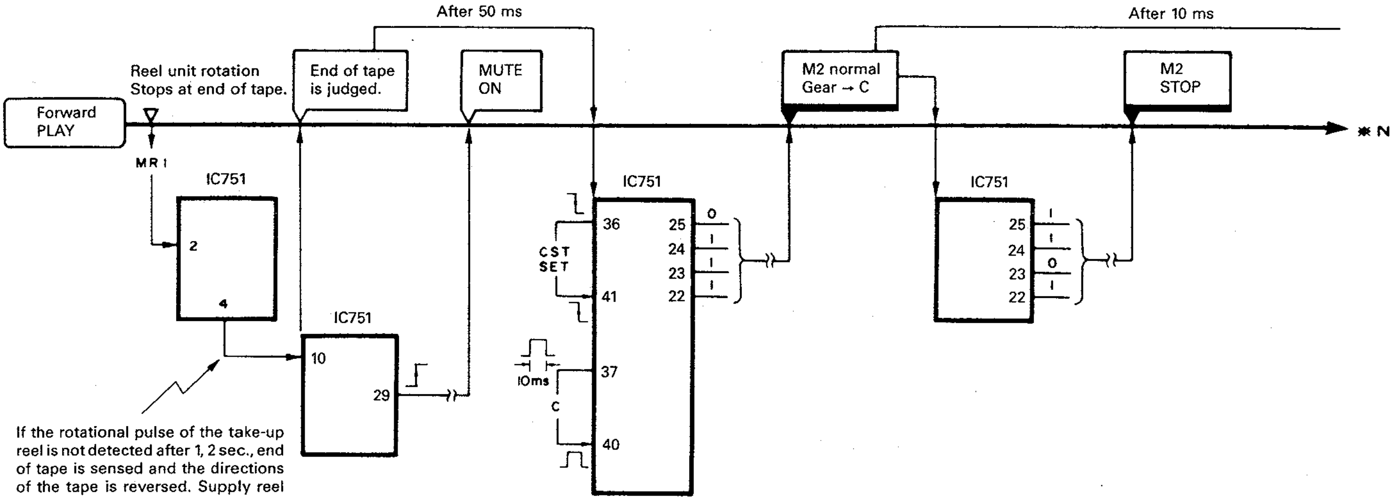

Reel rotational pulse is fed to pin ⑱ of IC751. IC 751 counts the pulse to measure the length of tape over-run caused by Reel interia.

※ K
End of tape rewinding
M3 STOP
M2 normal Gear → C
Gear → C
M2 STOP
M1 Reverse Head → EJ
※ L
IC751
37
36
CST SET
41
26
Music exist
No music
50ms
IC751
37
27
Q701 OFF
Q702 OFF
36
25
24
23
22
O
I
I
I
CST SET
41
IC751
H
37
C
40
25
24
23
22
I
I
O
I
IC751
38
MS
41
37
C
40
25
24
23
22
I
O
I
I

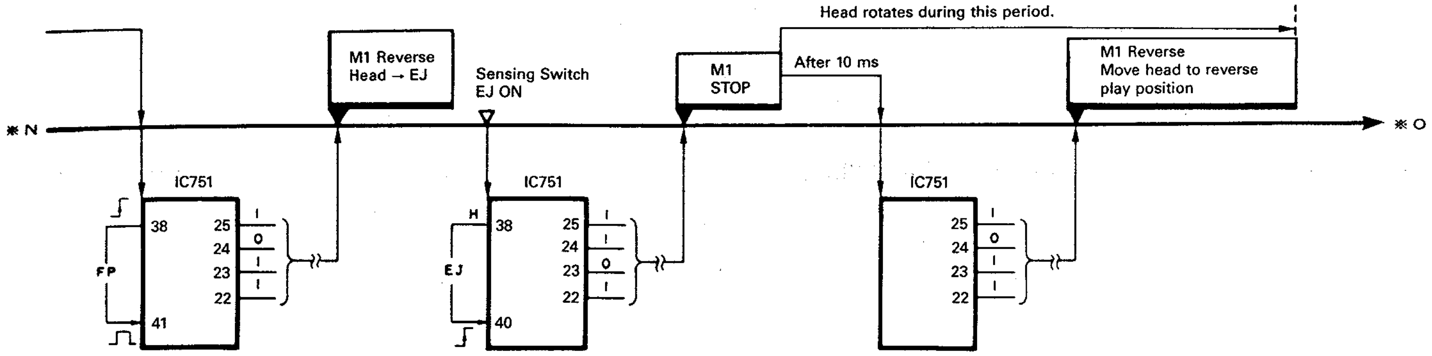

✱L
Head → EJ
M1 STOP
M1 normal Head → FP
PLAY
Switch MS amplifier filter
Head → FP
F · PLAY
M1 STOP
✱M
IC751
H
EJ
38
40
41
25
24
23
22
I
I
O
I
IC751
25
24
23
22
27
O
O
I
I
IC751
H
FP
38
42
40
25
24
23
22
27
29
I
I
O
I
Q702 ON
Q701 ON

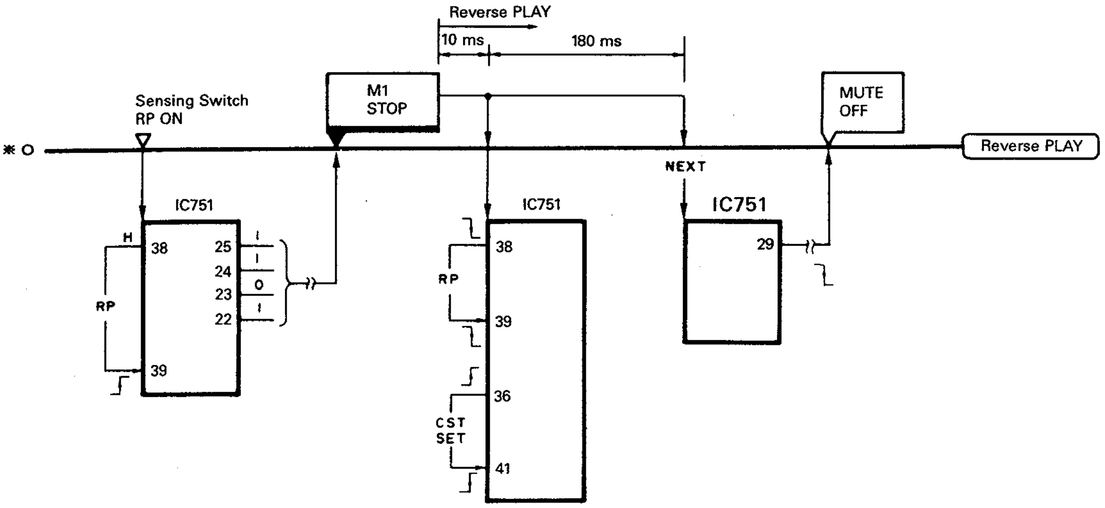

Tape overrun
M3 Constant speed
MUTE OFF
✱M
Forward PLAY

4. Forward PLAY → Reverse PLAY

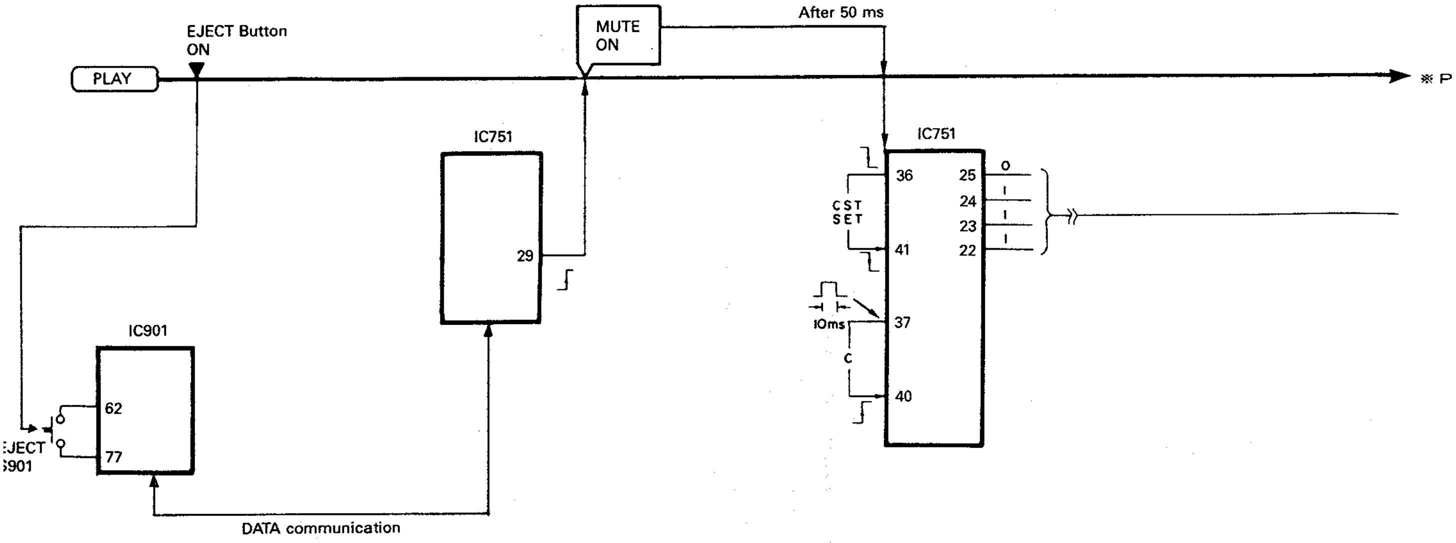

After 50 ms
After 10 ms
Reel unit rotation Stops at end of tape.
End of tape is judged.
MUTE ON
M2 normal Gear → C
M2 STOP
Forward PLAY
✱N
MR I
IC751
2
4
IC751
10
29
IC751
36
41
37
40
CST SET
10ms
C
25
24
23
22
O
I
I
I
IC751
25
24
23
22
I
I
O
I

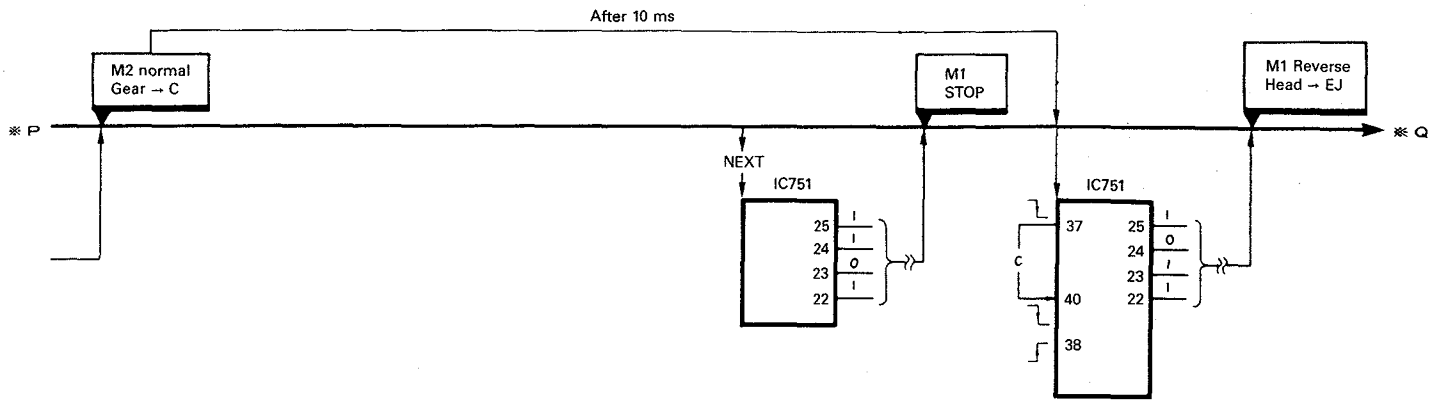
If the rotational pulse of the take-up reel is not detected after 1, 2 sec., end of tape is sensed and the directions of the tape is reversed. Supply reel pulse is ignored.

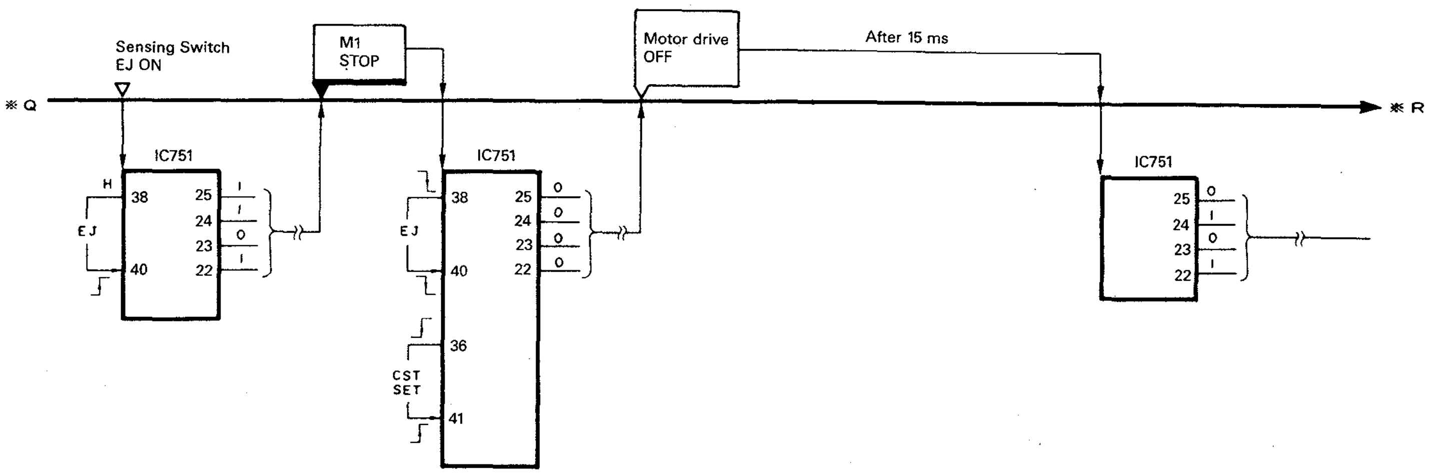

Head rotates during this period.
M1 Reverse
Head → EJ
Sensing Switch
EJ ON
M1
STOP
After 10 ms
M1 Reverse
Move head to reverse
play position
※N
※O
IC751
38
41
FP
25
24
23
22
I
O
I
I
IC751
H
38
40
EJ
25
24
23
22
I
I
O
I
IC751
25
24
23
22
I
O
I
I

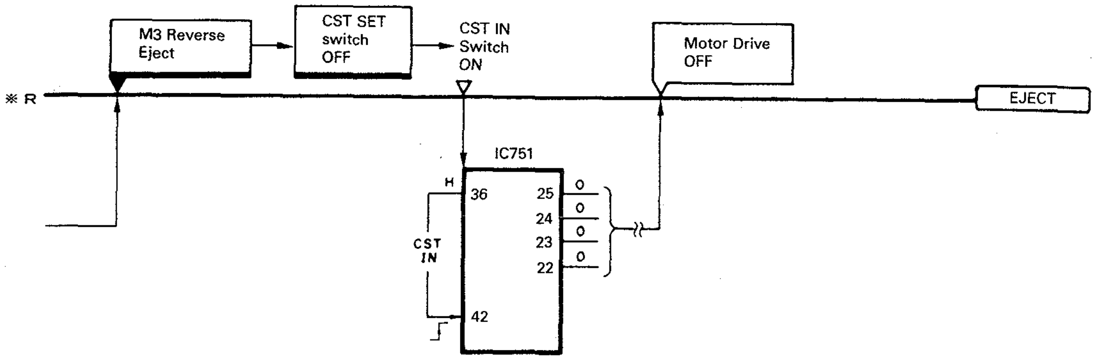

Reverse PLAY
10 ms
180 ms
Sensing Switch
RP ON
M1
STOP
MUTE
OFF
※O
Reverse PLAY
NEXT
IC751
H
38
39
RP
25
24
23
22
I
I
O
I
IC751
38
RP
39
36
CST
SET
41
IC751
29

5. PLAY → EJECT


EJECT Button
ON
MUTE
ON
After 50 ms
PLAY
※P
IC751
29
IC751
36
CST
SET
41
10ms
37
C
40
25
24
23
22
O
I
I
I
IC901
62
77
EJECT
S901
DATA communication


After 10 ms
M2 normal Gear → C
M1 STOP
M1 Reverse Head → EJ
※ P
※ Q
NEXT
IC751
25 I
24 I
23 0
22 I
IC751
37
40
38
C
25 I
24 0
23 I
22 I


Sensing Switch EJ ON
M1 STOP
Motor drive OFF
After 15 ms
※ Q
※ R
IC751
H
EJ
38
40
25 I
24 I
23 0
22 I
IC751
EJ
38
40
36
CST SET
41
25 0
24 0
23 0
22 0
IC751
25 0
24 I
23 0
22 I


M3 Reverse Eject
CST SET switch OFF
CST IN Switch ON
Motor Drive OFF
※ R
EJECT
IC751
H
CST IN
36
42
25 0
24 0
23 0
22 0

8. DISASSEMBLY

● Removing the Case Unit

1. Remove the Connector.
2. Remove the four screws (A), and remove the Case Unit.

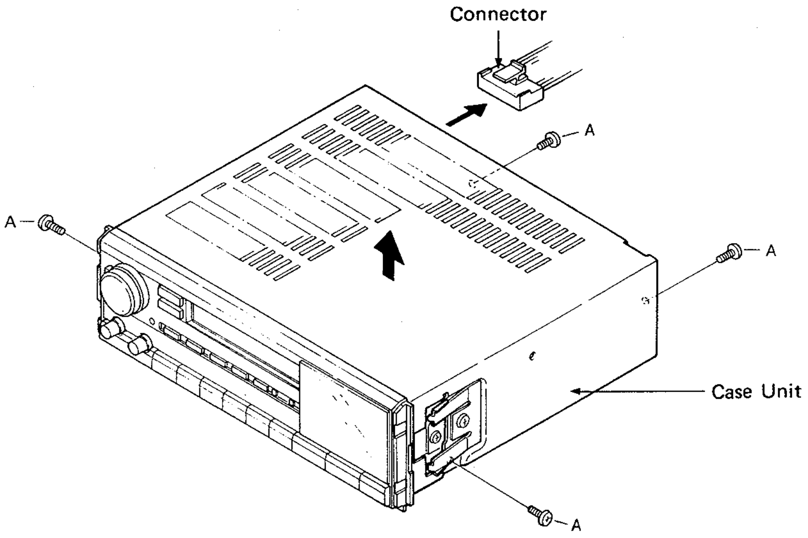

Connector
A
A
A
A
Case Unit

Fig. 28

● Removing the Grille Assy

1. Pull each knob toward you to release it.
2. Remove 4 hooks, then the grille assembly can be removed.

● Removing the Cassette Mechanism Assy

1. Remove 4 screws (B).
2. Pull the connector (20P) out while lifting the cassette mechanism assembly straight up.

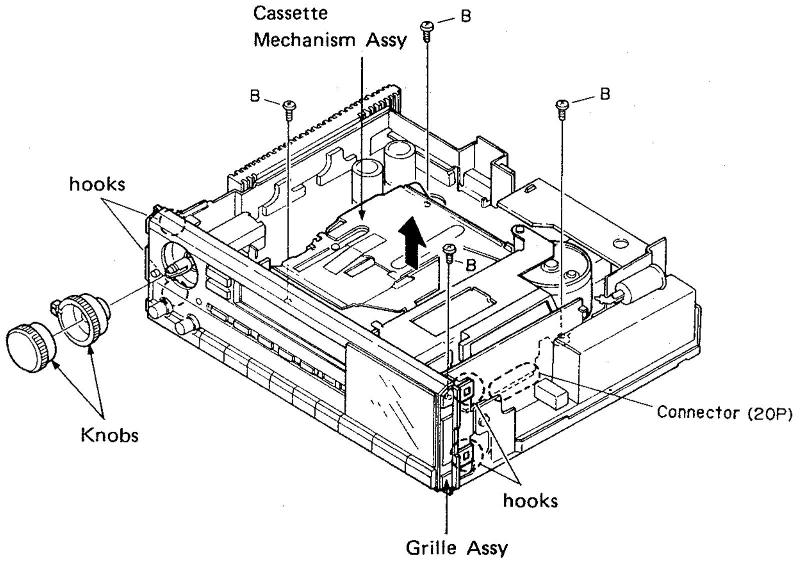

Cassette Mechanism Assy
B
B
B
B
hooks
Knobs
Connector (20P)
hooks
Grille Assy

Fig. 29

Removing the Heat Sink

1. Remove the four screws (C) and remove the heat sink.

Removing the Protective Circuit Unit

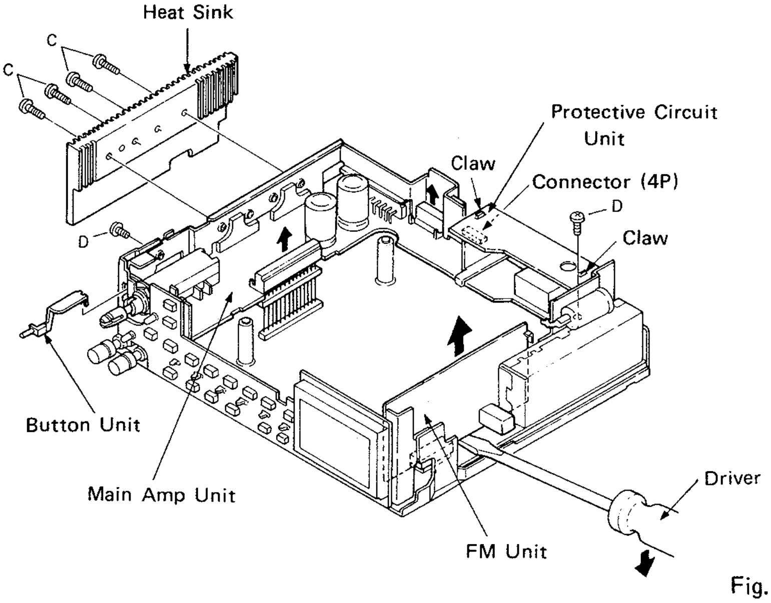
1. Stretch the claw (2 parts).
2. Remove the connector (4P).

Removing the Main Amp Unit

1. Remove the Button Unit.
2. Remove 2 screws (D).
3. Pull out the connectors (6P, 14P) while lifting the Main Amp Unit straight up.

Removing the FM Unit

1. .Insert a (–) screwdriver and move it toward the arrow, then the connector can be removed.



Heat Sink
C
C
D
Protective Circuit Unit
Claw
Connector (4P)
D
Claw
Button Unit
Main Amp Unit
Driver
FM Unit

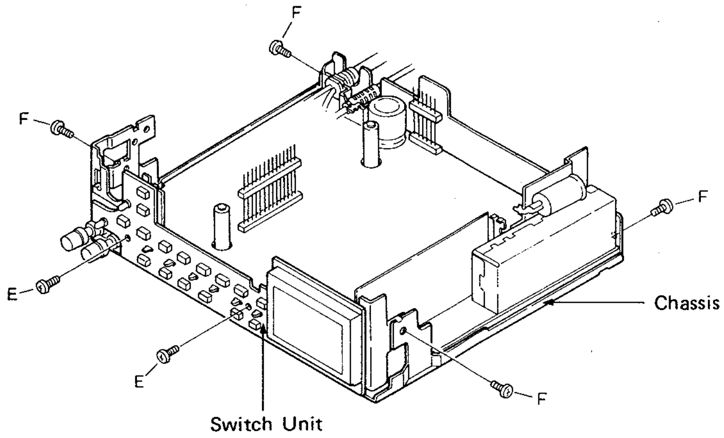
Fig. 30

Removing the chassis

1. Remove the four screws (F).

Removing the Switch Unit.

1. Remove the two screws (E).



F
F
F
E
Chassis
E
F
Switch Unit

Fig. 31

9. ADJUSTMENT

9.1 HEAD AZIMUTH ADJUSTMENT

• Connection Diagram

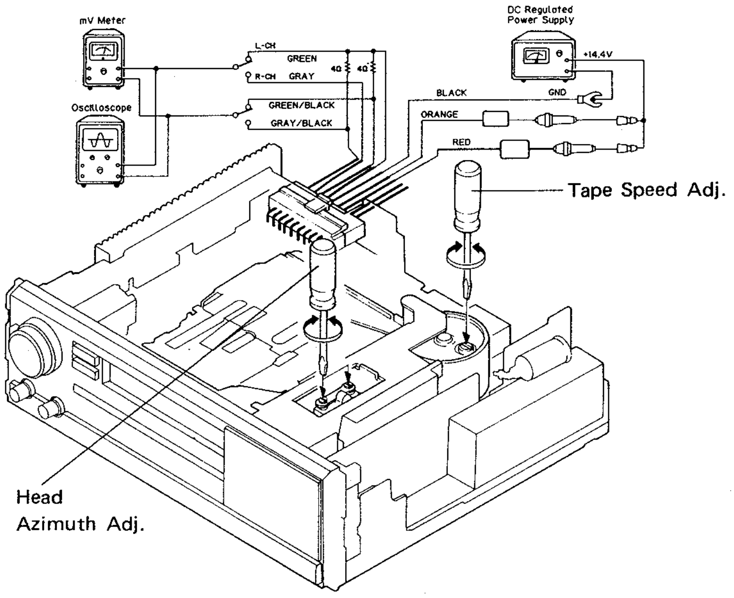

mV Meter
Oscilloscope
L-CH
GREEN
R-CH
GRAY
4Ω
4Ω
GREEN/BLACK
GRAY/BLACK
DC Regulated Power Supply
+14.4V
BLACK
GND
ORANGE
RED
Tape Speed Adj.
Head Azimuth Adj.

Fig. 32

• To Adjust

1. Play "A" side of STD-341A (10kHz, −20dB). Adjust each screw for maximum output in forward and reverse directions.
2. Play "B" side in forward and reverse directions to confirm adjustment.

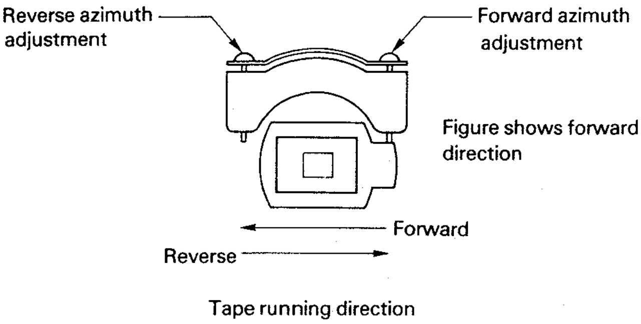

Reverse azimuth adjustment
Forward azimuth adjustment
Figure shows forward direction
Forward
Reverse
Tape running direction

Fig. 33

9.2 TAPE SPEED ADJUSTMENT

• Connection Diagram (shown in Fig. 32)

• To Adjust

1. Reproduce STD-301 (3kHz, −10dB). Adjust the semifixed resistor so that the frequency counter shows 3,010Hz (+30Hz, −30Hz).

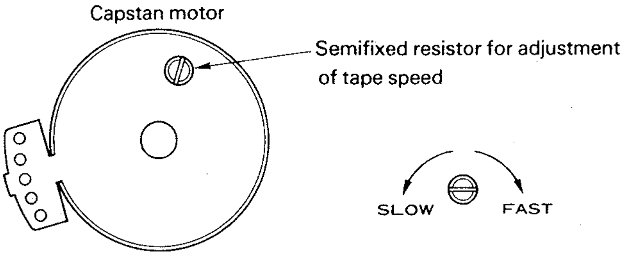

Capstan motor
Semifixed resistor for adjustment of tape speed
SLOW
FAST

Fig. 34

9.3 Dolby NR LEVEL ADJUSTMENT

● Connection Diagram

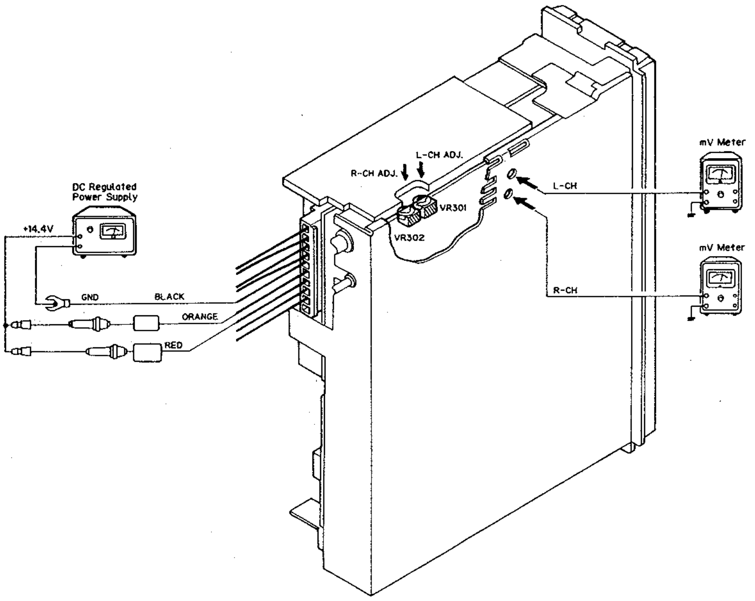

DC Regulated Power Supply
+14.4V
GND
BLACK
ORANGE
RED
R-CH ADJ.
L-CH ADJ.
VR301
VR302
L-CH
R-CH
mV Meter
mV Meter

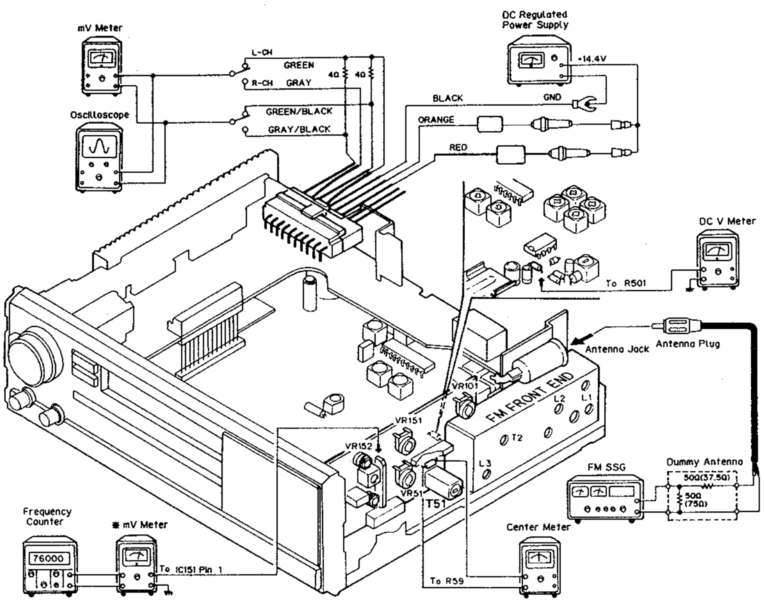
Fig. 35

● To Adjust

1. Set Dolby NR switch in "off" position.
2. Reproduce CT-150 (400Hz, 200nwb/m). Adjust VR 301 (left channel) and VR 302 (right channel) so that the mV meters show 300 mV. Adjustment accuracy should be ±1dB. (300mV=–8.2dBs)

9.4 FM IF ADJUSTMENT

- **Connection Diagram**


mV Meter
Oscilloscope
L-CH
GREEN
R-CH
GRAY
4Ω
4Ω
GREEN/BLACK
GRAY/BLACK
DC Regulated Power Supply
+14.4V
BLACK
GND
ORANGE
RED
DC V Meter
To R501
Antenna Jack
Antenna Plug
VR101
FM FRONT END
L2
L1
T2
VR151
VR152
L3
VR51
T51
FM SSG
Dummy Antenna
50Ω(37.5Ω)
50Ω
(75Ω)
Frequency Counter
76000
* mV Meter
To IC151 Pin 1
Center Meter
To R59

*mV Meter
Input Impedance . . . . . More than 1MΩ
Input Capacitor . . . . . . Less than 100pF

Fig. 36

- **To Adjust**

1. Set the Mono switch to MONO.
2. Apply a signal of 98.1 MHz, 400 Hz 30% modulation and 60 dB (μV) from the FM SSG and tune 98.1 MHz.
3. Adjust T51 to make the center meter show 0.

9.5 FM MPX ADJUSTMENT (KEH-9030/EW, 9020/US, CA, G)

- **Connection Diagram (shown in Fig. 36)**

- **To Adjust**

1. Set the mono switch to MONO.
2. Apply a 98.1MHz, 60dB (μV) unmodulated signal from FM SSG, then confirm that the frequency counter display is whithin 76kHz ± 120Hz.
3. Set the mono switch to AUTO.
4. Adjust VR151 to reduce the oscilliscope wave form to the minimum by only using pilot signal modulation (10%) and 60dB (μV).
5. Adjust VR101 to obtain the best separation by applying a stereo signal (1KHz, 100% modulation).
   (Turn VR152 all the way counterclockwise at this time.)
6. Adjust VR152 to obtain 5dB separation by making the input signal 35dB (μV).

9.6 FM MPX ADJUSTMENT (KEH-9030SDK/WG)

- **Connection Diagram (shown in Fig. 36)**

- **To Adjust**

1. Set the mono switch to MONO.
2. Apply a 98.1MHz, 60dB (μV) unmodulated signal from FM SSG, and confirm that the frequency coutner display is within 76kHz ± 120Hz.
3. Apply a 98.1MHz, 60dB (μV) MONO signal from FM SSG, then adjust the VOLUME so that the mV meter index becomes 0dB. Then turn input level control VR51 so that the output during 15dB (μV) becomes −3dB.
4. Set the Mono switch to AUTO.
5. Adjust VR151 to reduce the oscilloscope waveform to the minimum by only using pilot signal modulation (10%) and 60dB (μV).
6. Adjust VR101 to obtain the best separation by applying a stereo signal (1KHz, 100% modulation).
   (Turn VR152 all the way counterclockwise at this time.)
7. Adjust VR152 to obtain 5dB separation with a 35dB (μV) input signal.

9.7 FM TRACKING ADJUSTMENT

- **Connection Diagram (shown in Fig. 36)**

- **To Adjust [KEH-9030SDK/WG, EW, 9020/G (ES)]**

Frequency of FM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	108 MHz	L3	7.0±0.2 V	
2.	87.5 MHz		2.0±0.6 V check	
3. 89.9 MHz (400 Hz, 100% modulation) output level 5~10 dB (μV)	89.9 MHz	L1, L2		Maximum output
4. 98.1 MHz (400Hz, 100% modulation) output level 5~10 dB (μV)	98.1MHz	T2		Maximum output

- **To Adjust [KEH-9020/US, CA, G (US)]**

Frequency of FM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	107.9 MHz	L3	7.0±0.2 V	
2.	87.9 MHz		2.0±0.6 V check	
3. 89.9 MHz (400 Hz, 100% modulation) output level 5~10 dB (μV)	89.9 MHz	L1, L2		Maximum output
4. 98.1 MHz (400 Hz, 100% modulation) output level 5~10 dB (μV)	98.1 MHz	T2		Maximum output

9.8 SEEK SENSITIVITY ADJUSTMENT [KEH-9020/US, CA, G (US)]

- **Connection Diagram (shown in Fig. 36)**

1. Set the Loc. S switch to DX.
2. Apply a 98.1MHz, 400Hz, 30% modulation signal from FM SSG to perform auto search. Then adjust VR51 so that it stops at 25 ± 5dB (μV)

9.9 AM (LW) TRACKING ADJUSTMENT

- **Connection Diagram**

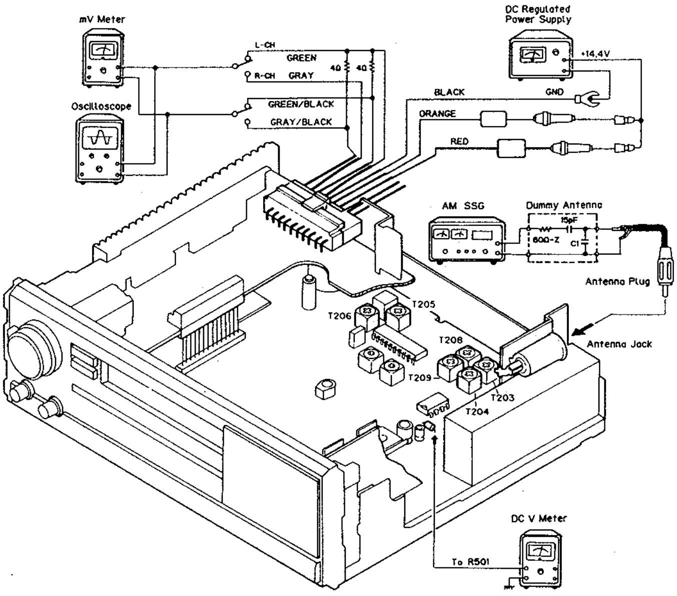

mV Meter
Oscilloscope
L-CH
GREEN
R-CH
GRAY
4Ω
4Ω
GREEN/BLACK
GRAY/BLACK
DC Regulated Power Supply
+14.4V
BLACK
GND
ORANGE
RED
AM SSG
Dummy Antenna
15pF
600-Z
C1
Antenna Plug
Antenna Jack
T205
T206
T208
T209
T203
T204
DC V Meter
To R501

Fig. 37

NOTICE:
Select C1 so that total capacity of 80pF is attained from the direction of the receiver jack.
Z: Output impedance of SSG.

- **To Adjust (KEH-9030SDK/WG, EW)**

Frequency of AM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	153 kHz	For Confirmation only	More than 2.5 V	
2. 218 kHz (400 Hz, 30% modulation) output level 25 dB (μV)	218 kHz	T208 T209		Maximum output
3.	281 kHz	For Confirmation Only	Less than 7.0 V	

9.10 AM (MW) TRACKING ADJUSTMENT

- Connection Diagram (shown in Fig. 37)

- To Adjust (KEH-9030SDK/WG, EW, 9020/G (ES))

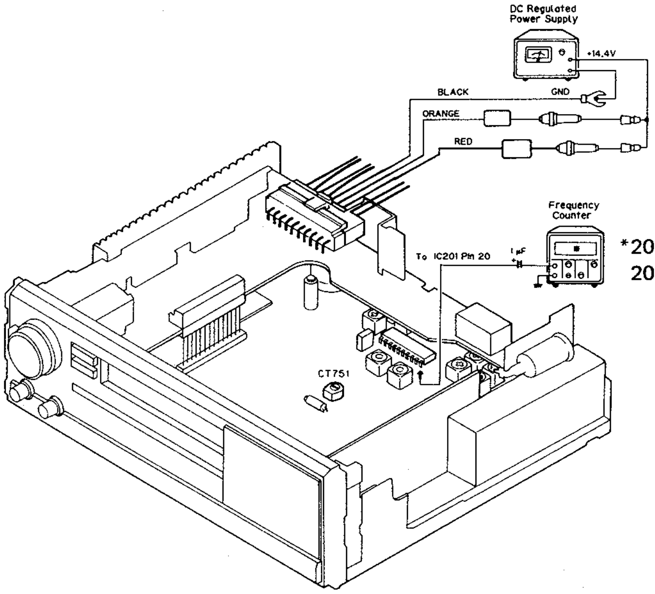
Frequency of AM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	1,602 kHz	For Confirmation only	Less than 7.9 V	
2.	531 kHz	For Confirmation only	More than 0.8 V	
3. 603 kHz (400 Hz, 30% modulation) output level 25 dB (μV)	603 kHz	T203, T204 T205, T206		Maximum output
603 kHz 4. 999 kHz (400 Hz, 30% modulation) 1,395 kHz output level 35 dB (μV)	603 kHz 999 kHz 1,395 kHz	For Confirmation Only		The difference between the maximum and minimum output levels at 603 kHz, 999 kHz, and 1,395 kHz must be 6 dB or less.

- To Adjust (KEH-9020/US, CA, G (US))

Frequency of AM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	1,620 kHz	For Confirmation only	Less than 7.9 V	
2.	530 kHz	For Confirmation only	More than 0.8 V	
3. 600 kHz (400 Hz, 30% modulation) output level 25 dB (μV)	600 kHz	T203, T204 T205, T206		Maximum output
600 kHz 4. 1,000 kHz (400 Hz, 30% modulation) 1,400 kHz output level 35 dB (μV)	600 kHz 1,000 kHz 1,400 kHz	For Confirmation Only		The difference between the maximum and minimum output levles at 600 kHz, 1,000 kHz, and 1,400 kHz must be 6 dB or less.

9.11 REFERENCE OSCILLATION FREQUENCY ADJUSTMENT

• Connection Diagram


DC Regulated Power Supply
+14.4V
BLACK
GND
ORANGE
RED
Frequency Counter
To IC201 Pin 20
1 μF
CT751

*2070kHz : KEH-9020/US, CA, G(US)
2052kHz : KEH-9020/G(ES)

Fig. 38

• To Adjust (KEH-9020/US, CA, G (US))

1. Set the AM position.
2. Set the LCD display to 1620KHz.
3. Adjust CT751 so that the frequency counter display becomes 2070kHz ± 10Hz.

• To Adjust (KEH-9020/G (ES))

1. Set the AM position.
2. Set the LCD display to 1602KHz.
3. Adjust CT751 so that the frequency counter display becomes 2052kHz ± 10Hz.

9.12 SDK DECODER ADJUSTMENT (KEH-9030SDK/WG)

- **Connection Diagram**

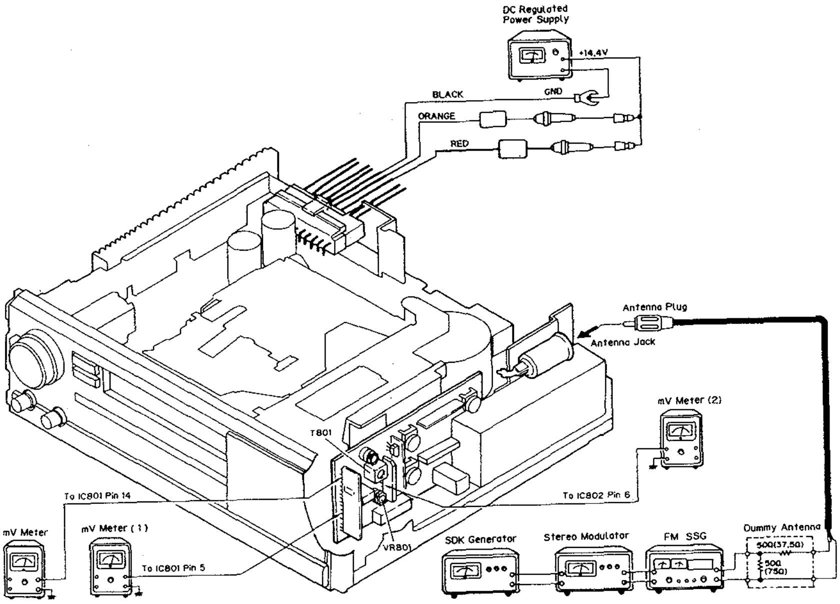

DC Regulated Power Supply
+14.4V
BLACK
GND
ORANGE
RED
Antenna Plug
Antenna Jack
mV Meter (2)
T801
To IC801 Pin 14
To IC802 Pin 6
mV Meter
mV Meter (1)
To IC801 Pin 5
VR801
SDK Generator
Stereo Modulator
FM SSG
Dummy Antenna
50Ω(37.5Ω)
50Ω
(75Ω)

Fig. 39

- **To Adjust**

1. Set the FM SSG as follows.
   Carrier: 98.1MHz, 60dB (μV)
   Modulation (audio): 400Hz, 60%
   Modulation (SK): 57KHz, 5%
   Modulation (DK): 125Hz, 30%

[57KHz filter adjustment]

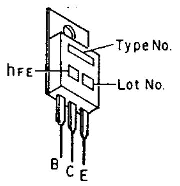
2. Apply an SK signal (57KHz, 5%) and adjust T801 so that the mV meter index is maximum.

[DK Schmidt level adjustment]

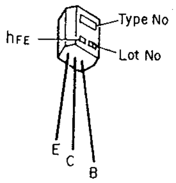
3. Apply DK (125Hz, 30%) and SK (57KHz, 5%) signals, then adjust VR801 so that the level difference between mV meter (1) and mV meter (2) becomes 1.5 dB.

ICs and Transistors

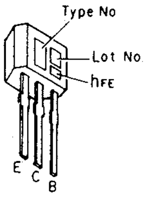
2SB941


Type No.
hFE
Lot No.
B
C
E

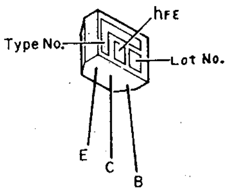
2SA1150
2SC2458
2SA1048
2SC1740S


Type No
hFE
Lot No
E
C
B

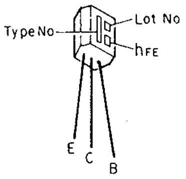
2SC536SP


Type No
Lot No
hFE
E
C
B

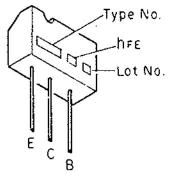
2SD1468S


hFE
Type No.
Lot No.
E
C
B

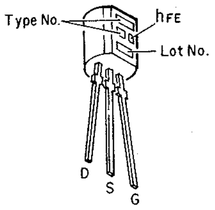
2SD1012


Lot No
Type No
hFE
E
C
B

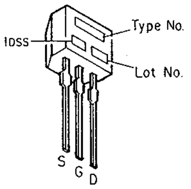
2SD1055F
2SC2021F


Type No.
hFE
Lot No.
E
C
B

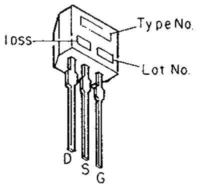
2SK435


Type No.
hFE
Lot No.
D
S
G

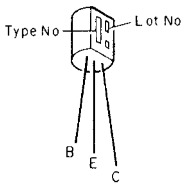
2SK330


IDSS
Type No.
Lot No.
S
G
D

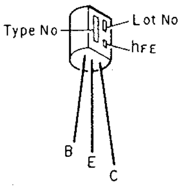
2SK241

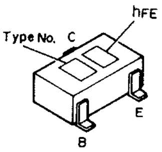

IDSS
Type No.
Lot No.
D
S
G

2SC2753

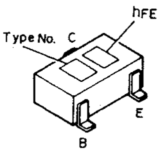

Type No
Lot No
B
E
C

2SC2570


Type No
Lot No
hFE
B
E
C

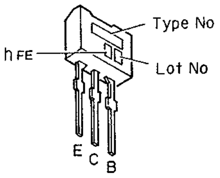
Parts No.	Indication(Type No., hFE)
2SC2712-LG	LG 
2SC2712-LL	LL
2SC2712-LY	LY
2SD601-YQ	YQ
2SD601-YR	YR
2SD601-YS	YS

hFE
Type No.
C
E
B

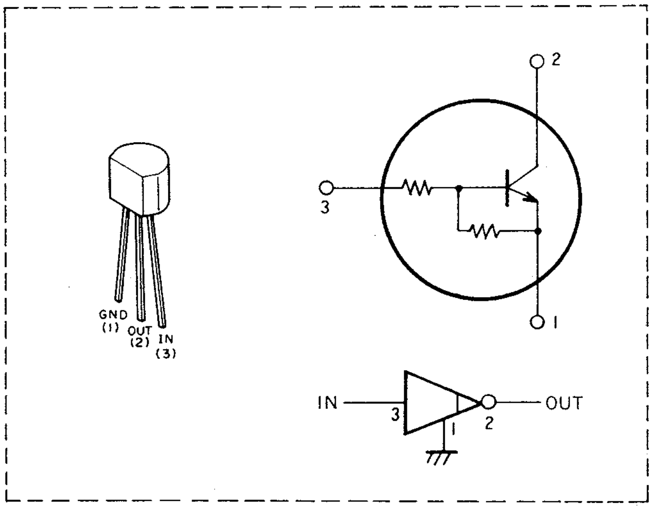
Parts No.	Indication(Type No., hFE)
2SB709-AQ	AQ 
2SB709-AR	AR
2SB709-AS	AS
2SA1179-M4	M4
2SA1179-M5	M5
2SA1179-M6	M6

hFE
Type No.
C
E
B

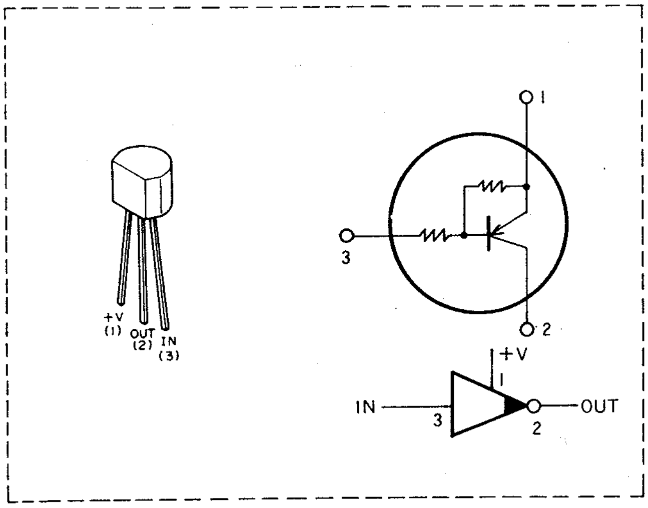
2SB1066MF


Type No
hFE
Lot No
E
C
B

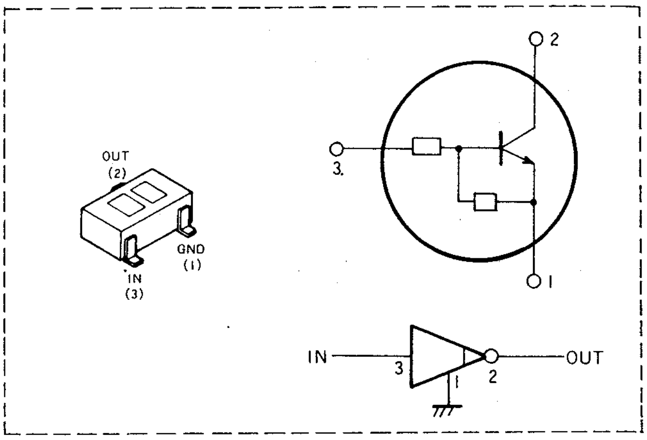
DTC124ES, UN4212


GND (1)
OUT (2)
IN (3)
2
3
1
IN
3
1
2
OUT

DTA114ES,
DTA124ES, DTA144ES, UN4111, UN4113

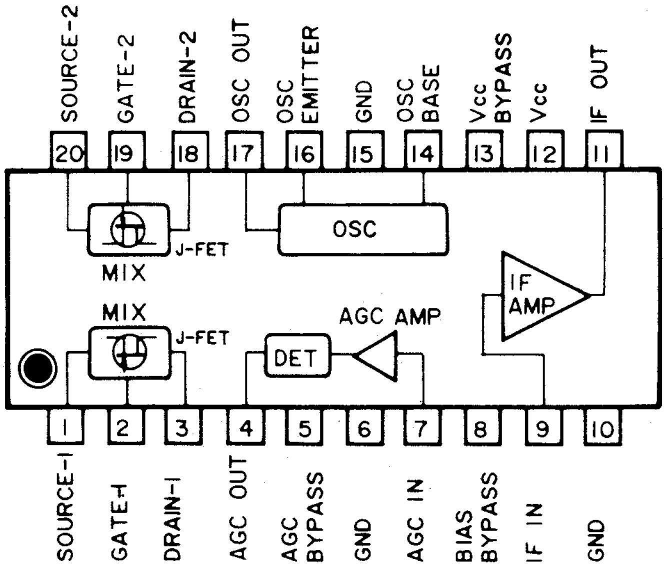

+V
(1)
OUT
(2)
IN
(3)
1
3
2
+V
1
IN
3
2
OUT

UN2216, DTC143TK
Chip transistor

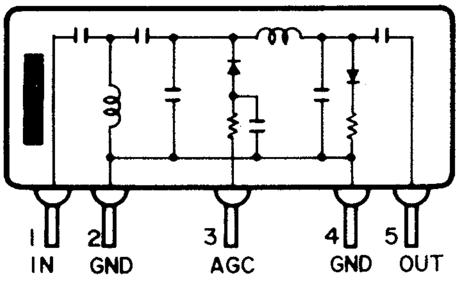

OUT
(2)
GND
(1)
IN
(3)
2
3
1
IN
3
1
2
OUT

FM Front End

IC2 : PA4009

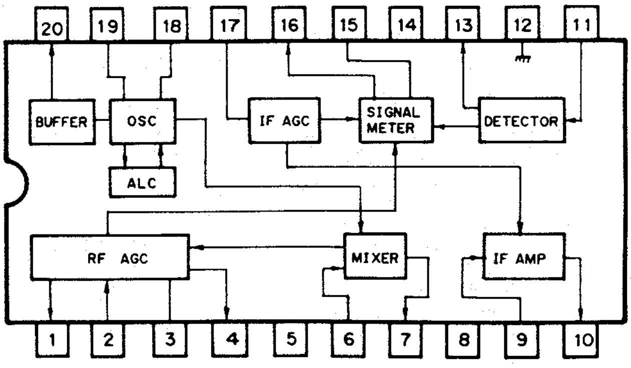

SOURCE-2
GATE-2
DRAIN-2
OSC OUT
OSC EMITTER
GND
OSC BASE
Vcc BYPASS
Vcc
IF OUT
20
19
18
17
16
15
14
13
12
11
MIX
J-FET
OSC
MIX
J-FET
DET
AGC AMP
IF AMP
1
2
3
4
5
6
7
8
9
10
SOURCE-1
GATE-1
DRAIN-1
AGC OUT
AGC BYPASS
GND
AGC IN
BIAS BYPASS
IF IN
GND

IC1 : CWW-173
CWW1015

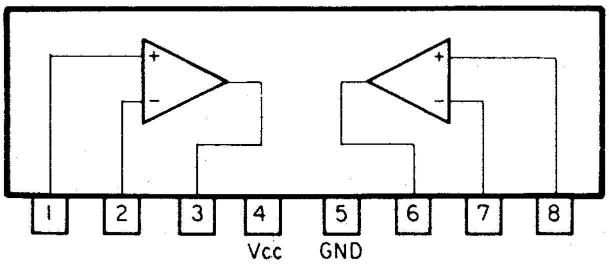

1
IN
2
GND
3
AGC
4
GND
5
OUT

Tuner Unit

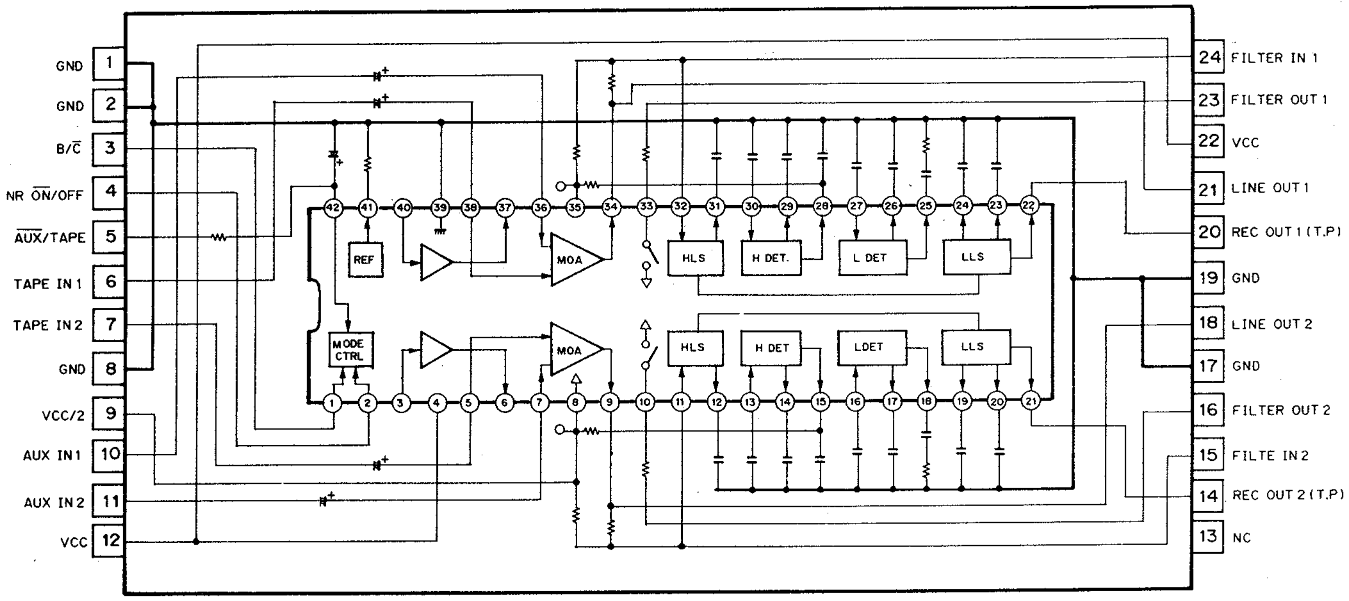
IC201 : LA1135


20
19
18
17
16
15
14
13
12
11
BUFFER
OSC
IF AGC
SIGNAL METER
DETECTOR
ALC
RF AGC
MIXER
IF AMP
1
2
3
4
5
6
7
8
9
10

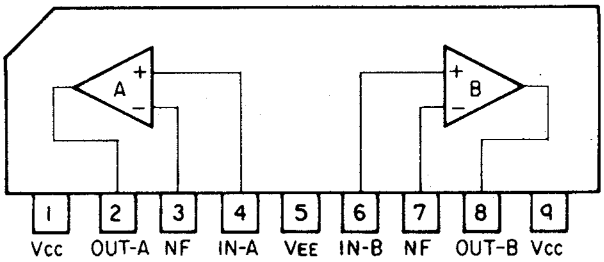
IC251 : M51522AL


+
−
+
−
1
2
3
4
5
6
7
8
Vcc
GND

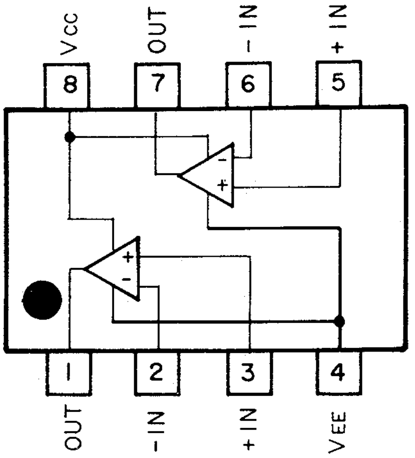
IC301 : BH-2401B


GND 1
GND 2
B/C̄ 3
NR ON̄/OFF 4
ĀŪX̄/TAPE 5
TAPE IN 1 6
TAPE IN 2 7
GND 8
VCC/2 9
AUX IN 1 10
AUX IN 2 11
VCC 12
24 FILTER IN 1
23 FILTER OUT 1
22 VCC
21 LINE OUT 1
20 REC OUT 1 (T.P)
19 GND
18 LINE OUT 2
17 GND
16 FILTER OUT 2
15 FILTE IN 2
14 REC OUT 2 (T.P)
13 NC
REF
MOA
HLS
H DET.
L DET
LLS
MODE CTRL
MOA
HLS
H DET
LDET
LLS

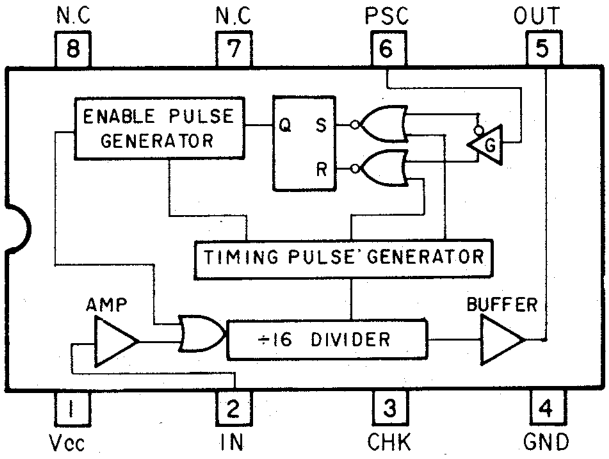
IC351 : TA75558S


A
B
1 Vcc
2 OUT-A
3 NF
4 IN-A
5 VEE
6 IN-B
7 NF
8 OUT-B
9 Vcc

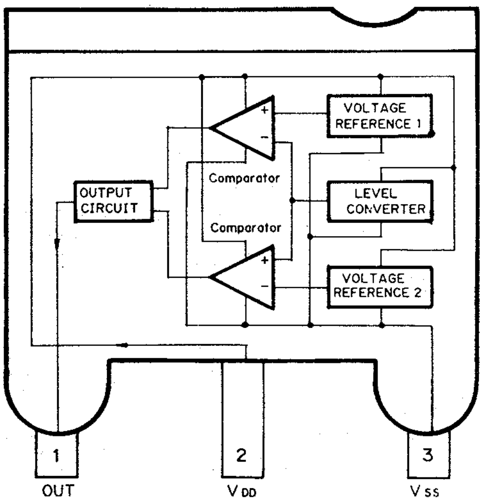
IC451 : NJM4558S


8 Vcc
7 OUT
6 − IN
5 + IN
1 OUT
2 − IN
3 + IN
4 VEE

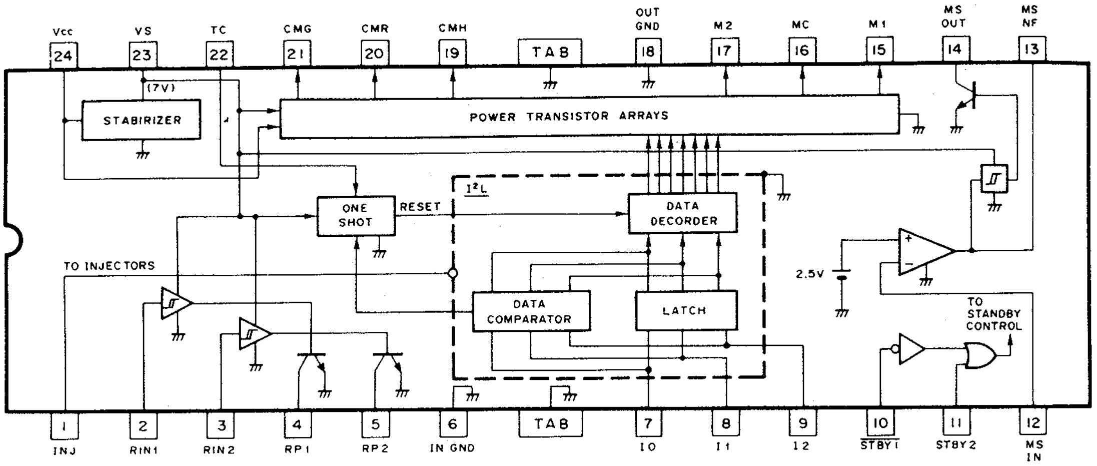
IC501 : μPB553AC


8 N.C
7 N.C
6 PSC
5 OUT
ENABLE PULSE GENERATOR
Q S R
G
TIMING PULSE GENERATOR
AMP
BUFFER
÷16 DIVIDER
1 Vcc
2 IN
3 CHK
4 GND

IC752 : MN1280


VOLTAGE REFERENCE 1
Comparator
LEVEL CONVERTER
OUTPUT CIRCUIT
Comparator
VOLTAGE REFERENCE 2
1 OUT
2 VDD
3 VSS

IC701 : PA3019

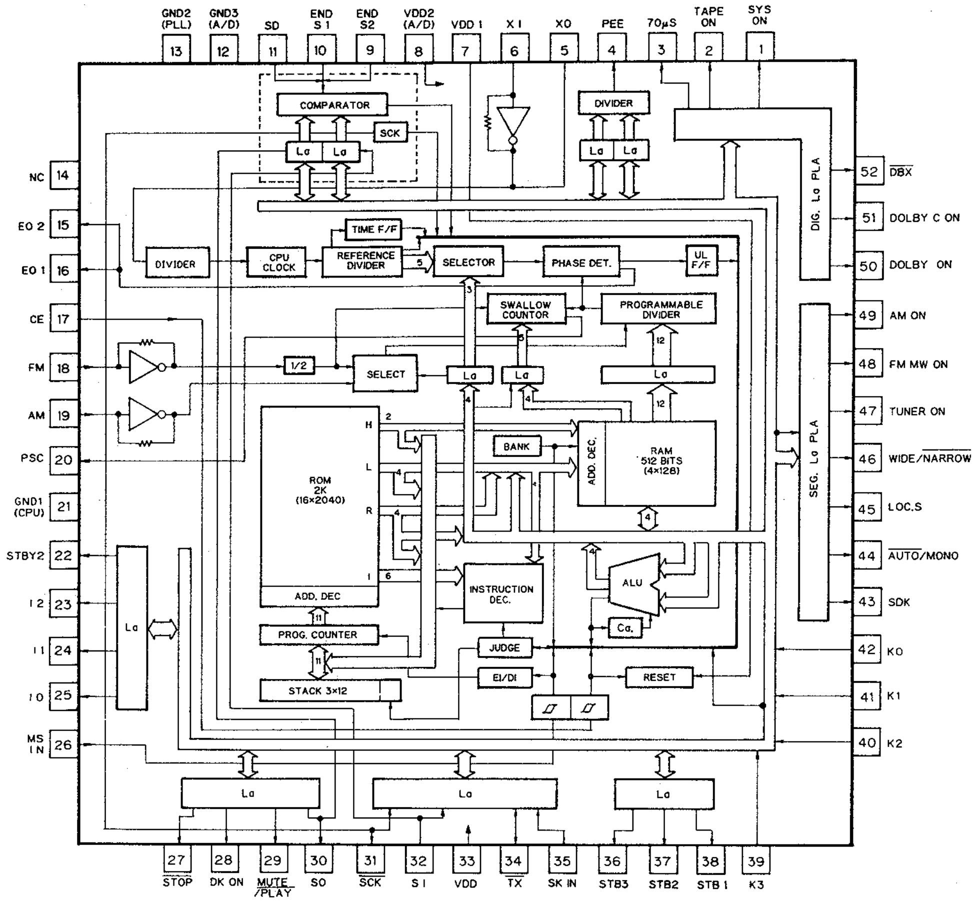

Vcc
VS
TC
CMG
CMR
CMH
OUT GND
M2
MC
M1
MS OUT
MS NF
24
23
22
21
20
19
TAB
18
17
16
15
14
13
(7V)
STABIRIZER
POWER TRANSISTOR ARRAYS
ONE SHOT
RESET
I^2L
DATA DECORDER
TO INJECTORS
DATA COMPARATOR
LATCH
2.5V
TO STANDBY CONTROL
1
2
3
4
5
6
TAB
7
8
9
10
11
12
INJ
RIN1
RIN2
RP1
RP2
IN GND
I0
I1
I2
STBY1
STBY2
MS IN

• Pin Functions (PA3019) (Deck Driver)

Pin No.	Pin Name	I/O	Function and Operation
1	INJ	Input	"Internal logic" (I^2L) power source
2	RIN1	Input	Input pin for reel unit rotation sensor (MR 1)
3	RIN2	Input	Input pin for reel unit rotation sensor (MR 2)
4	RP1	Output	Output for wave form signal from reel sensor input 1 (pin 2)
5	RP2	Output	Output for wave form signal from reel sensor input 2 (pin 3)
6	IN GND	–	Low signal system ground pin
7	I0	Input	Motor control logic input pin
8	I1	Input	
9	I2	Input	
10	STBY1	Input	Standby control – switches IC power circuit off at active low (0.7V or less).
11	STBY2	Input	Standby control – switches IC power circuit off at active high (3.5V or more).
12	MSIN	Input	Input (inverted) pin for MS amp.
13	MSNF	Output/ Input	MS amp. output and MS Schmitt circuit input
14	MSOUT	Output	MS Schmitt circuit output – when signal level at MSNF pin exceeds 0 dBm, pulse is outputted open when below 0 dBm
15	M1	Output	Drive output "+" pin for head drive motor M1
16	MC	Output	Drive output common pin for motors M1 and M2
17	M2	Output	Drive output "+" pin for drive motor M2 ("FF/REW" switching gear)
18	OUT GND	–	Motor drive circuit ground pin
19	CMH	Output	Drive output H (+) pin for capstan motor M3 output voltage: During speed control: app. Vcc–1.7V During loading and eject: 6.9V
20	CMR	Output	Drive output R pin for capstan motor M3 During speed control: open During loading: app. 0V During eject: app. 7V
21	CMG	Output	Drive output GND (–) pin for capstan motor M3 During speed control: app. 0V During loading and eject: open
22	TC	Output	Pin for capacitor for setting timer to switch power transistor off in a set time when logic inputs I0, I1, I2 change.
23	VS	Output	Power source for reel rotation sensor – app. 7V
24	Vcc	Input	IC power supply pin

*IC751 : PD4077C

*IC's marked by * are MOS type.*
Be careful in handling them because they are very liable to be damaged by electrostatic induction.



GND2 (PLL) 13
GND3 (A/D) 12
SD 11
END S1 10
END S2 9
VDD2 (A/D) 8
VDD 1 7
X I 6
XO 5
PEE 4
70μS 3
TAPE ON 2
SYS ON 1
NC 14
EO 2 15
EO 1 16
CE 17
FM 18
AM 19
PSC 20
GND1 (CPU) 21
STBY2 22
I 2 23
I 1 24
I 0 25
MS IN 26
27 STOP
28 DK ON
29 MUTE /PLAY
30 SO
31 SCK
32 S I
33 VDD
34 TX
35 SK IN
36 STB3
37 STB2
38 STB 1
39 K3
52 DBX
51 DOLBY C ON
50 DOLBY ON
49 AM ON
48 FM MW ON
47 TUNER ON
46 WIDE/NARROW
45 LOC.S
44 AUTO/MONO
43 SDK
42 KO
41 K1
40 K2
COMPARATOR
SCK
La
DIVIDER
DIG. La PLA
TIME F/F
CPU CLOCK
REFERENCE DIVIDER
SELECTOR
PHASE DET.
UL F/F
SWALLOW COUNTOR
PROGRAMMABLE DIVIDER
1/2
SELECT
ROM 2K (16×2040)
H
L
R
I
ADD. DEC
PROG. COUNTER
STACK 3×12
BANK
ADD. DEC.
RAM 512 BITS (4×128)
SEG. La PLA
INSTRUCTION DEC.
ALU
Ca.
JUDGE
EI/DI
RESET

Fig. 40

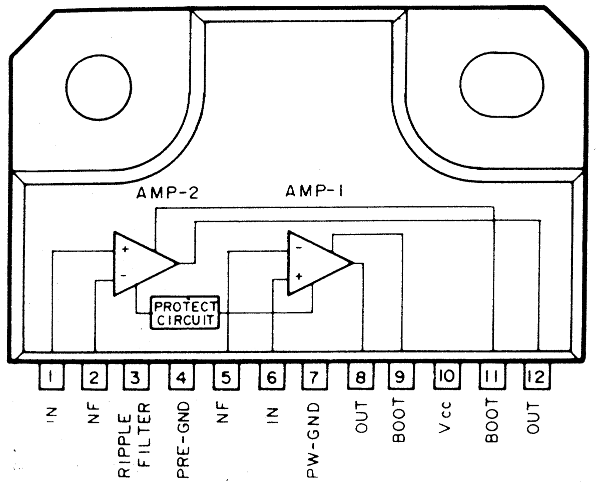
• PD4077C Pin Functions (Deck・Tuner Controller)

Pin No.	Pin Name	I/O	Function and Operation
1	SYS ON	OUT	HIGH when TAPE, TUNER or AUX (CD) is on.
2	TAPE ON	OUT	HIGH during TAPE operation
3	70μS	OUT	HIGH during TAPE mode and metal tape detection
4	PEE	OUT	Outputs Pee sound and SKD alarm sound.
5	XO		Crystal oscillator (4.5MHz) connection terminal
6	XI		
7	VDD1		Power supply terminal
8	VDD2		
9	ENDS2	IN	Reel rotation detection terminal. Detects IC701 (PA3019) pulse output.
10	ENDS1	IN	
11	SD	IN	Stop input terminal during seek and scan operation. Seek and scan stops during HIGH.
12	GND3		GND
13	GND2		
14	NC		No Connection

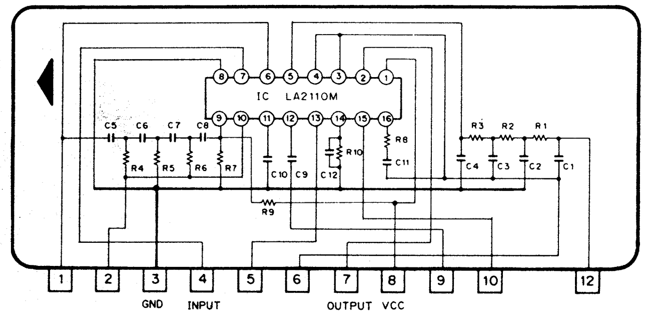
Pin No.	Pin Name	I/O	Function and Operation
15	E02	OUT	PLL error output terminal
16	E01	OUT	When the divided oscillation frequency is higher than the reference frequency, HIGH output occurs from this terminal. When the frequency is lower, LOW output occurs. When they match, floating occurs.
17	CE	IN	Device selection signal input terminal
18	FM	IN	FM programmable counter input terminal Inputs FM local oscillation (VCO) output divided into 1/16, 1/17 by a prescaler (μPB553AC).
19	AM	IN	AM programmable counter input terminal Inputs AM local oscillation (VCO) output
20	PSC	OUT	Controls prescaler frequency division switching (1/16, 1/17)
21	GND1		GND
22	STBY2	OUT	Outputs data to IC701 (PA3019)
23	I2	OUT	Standby status with HIGH
24	I1	OUT	I_2 — I_0 are motor control logic output terminals
25	I0	OUT	
26	MS IN	IN	Tape interim music detection terminal. Detects pulse output from IC701 (PA3019) to decide music or no music.
27	$\overline{\text{STOP}}$	OUT	Capstan motor control terminal Capstan motor stops with LOW.
28	DK ON	OUT	HIGH during SDK and DK signal reception (KEH-9030SDK/WG)
29	MUTE/$\overline{\text{PLAY}}$	OUT	LOW during PLAY operation HIGH otherwise and during mute operation
30	SO	OUT	Serial output terminal
31	$\overline{\text{SCK}}$	IN/OUT	Serial output terminal
32	SI	IN	Serial input terminal
33	VDD		Power supply terminal
34	$\overline{\text{TX}}$	IN/OUT	Communication with others, disabled with LOW output during communication.
35	SK IN	IN	SK signal input terminal during SDK.
36	STB3	OUT	When the cassette mechanism status changes, a strobe is outputted for the status detection key matrix.
37	STB2	OUT	
38	STB1	OUT	HIgh impedance in a steady state
39	K3	IN	Cassette mechanism status detection key input terminal
40	K2	IN	
41	K1	IN	
42	K0	IN	
43	SDK	OUT	HIGH during SDK ON (KEH-9030SDK/WG)
44	AUTO/$\overline{\text{MONO}}$	OUT	Auto status with LOW during Tuner mode
45	LOC.S	OUT	HIGH during local search
46	WIDE/$\overline{\text{NARROW}}$	OUT	WIDE status with HIGH
47	TUNER ON	OUT	No Connection
48	FM MW ON	OUT	HIGH during FM or MW
49	AM ON	OUT	HIGH during MW or LW
50	DOLBY ON	OUT	HIGH during Dolby ON.
51	DOLBY C ON	OUT	HIGH during Dolby C ON
52	$\overline{\text{DBX}}$	OUT	No Connection

• Main Amp Unit

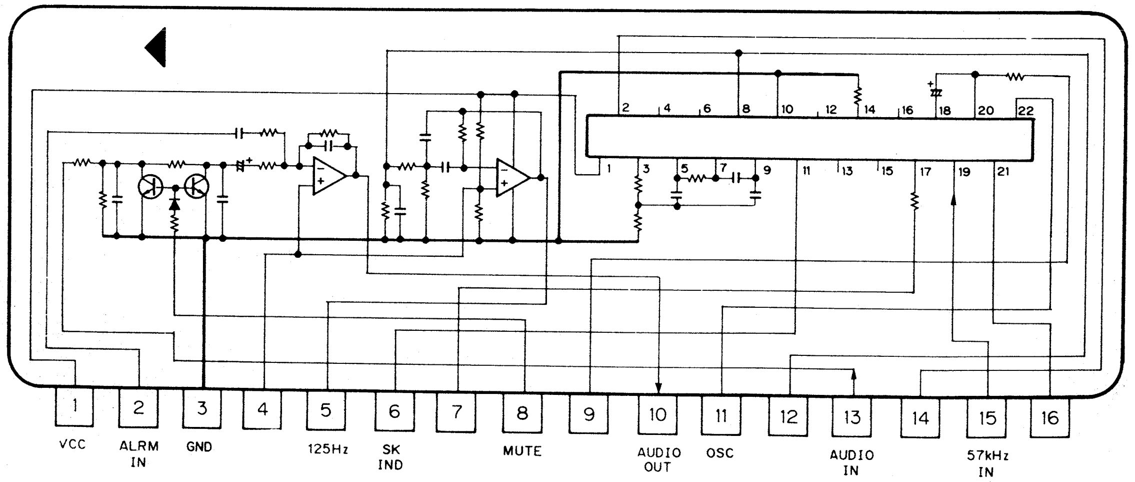
IC551, 552 : TA7270P


AMP-2
AMP-1
PROTECT CIRCUIT
1 IN
2 NF
3 RIPPLE FILTER
4 PRE-GND
5 NF
6 IN
7 PW-GND
8 OUT
9 BOOT
10 Vcc
11 BOOT
12 OUT

IC101 : KHA115

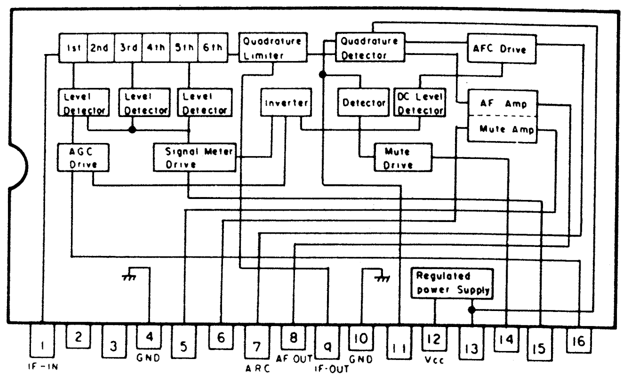

IC LA2110M
C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12
R1 R2 R3 R4 R5 R6 R7 R8 R9 R10
1 2 3 4 5 6 7 8 9 10 12
GND
INPUT
OUTPUT
VCC

IC801 : KHA132

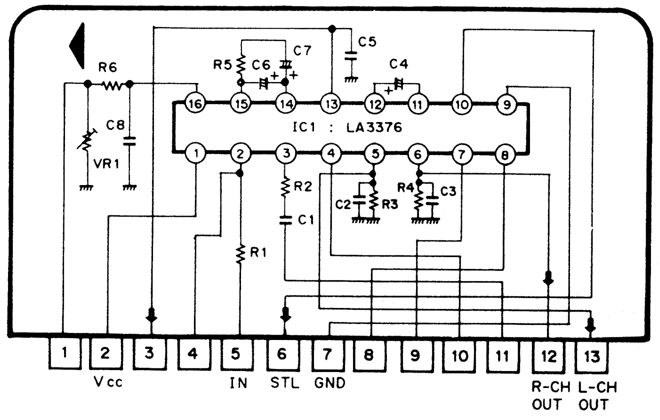

1 VCC
2 ALRM IN
3 GND
4
5 125Hz
6 SK IND
7
8 MUTE
9
10 AUDIO OUT
11 OSC
12
13 AUDIO IN
14
15 57kHz IN
16

• FM Unit

IC51 : LA1140B


1st
2nd
3rd
4th
5th
6th
Quadrature Limiter
Quadrature Detector
AFC Drive
Level Detector
Level Detector
Level Detector
Inverter
Detector
DC Level Detector
AF Amp
Mute Amp
AGC Drive
Signal Meter Drive
Mute Drive
Regulated power Supply
1 IF-IN
4 GND
7 ARC
8 AF OUT
9 IF-OUT
10 GND
12 Vcc

IC151 : MX3S400


IC1 : LA3376
R1 R2 R3 R4 R5 R6
C1 C2 C3 C4 C5 C6 C7 C8
VR1
2 Vcc
5 IN
6 STL
7 GND
12 R-CH OUT
13 L-CH OUT

• Switch Unit

*IC's marked by * are MOS type.*
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

*IC901 : PD4078C

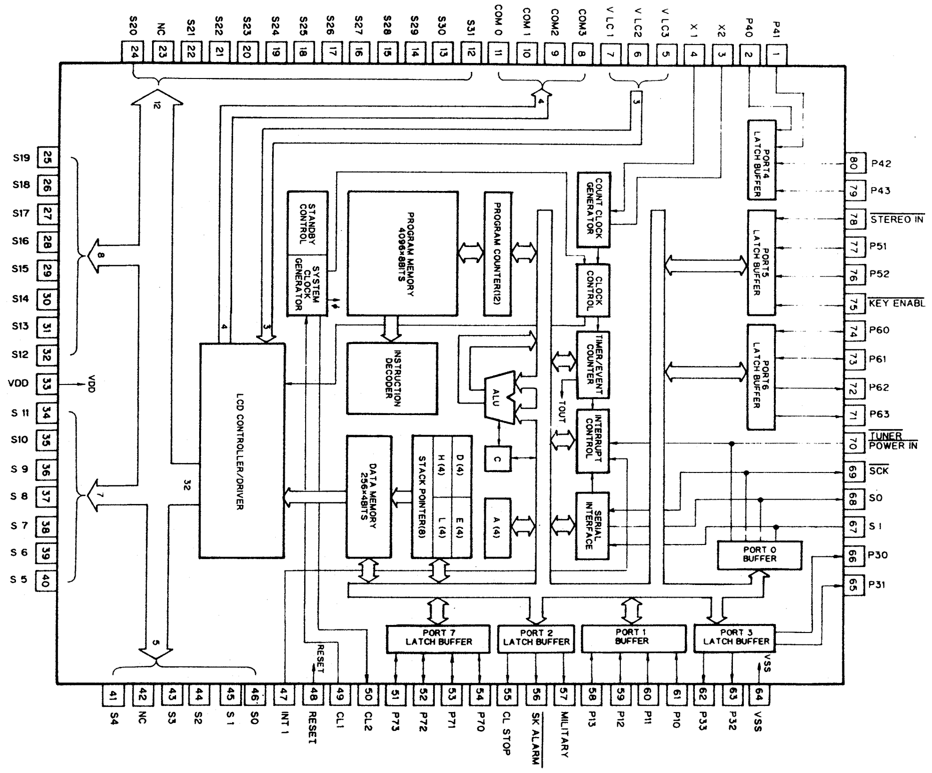

S20 NC S21 S22 S23 S24 S25 S26 S27 S28 S29 S30 S31 COM 0 COM 1 COM2 COM3 VLC1 VLC2 VLC3 X1 X2 P40 P41
24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
S19 25
S18 26
S17 27
S16 28
S15 29
S14 30
S13 31
S12 32
VDD 33
S11 34
S10 35
S9 36
S8 37
S7 38
S6 39
S5 40
12
8
7
5
4
3
32
VDD
STANDBY CONTROL
SYSTEM CLOCK GENERATOR
PROGRAM MEMORY 4096×8BITS
PROGRAM COUNTER(12)
COUNT CLOCK GENERATOR
CLOCK CONTROL
INSTRUCTION DECODER
ALU
TIMER/EVENT COUNTER
TOUT
INTERRUPT CONTROL
SERIAL INTERFACE
LCD CONTROLLER/DRIVER
DATA MEMORY 256×4BITS
STACK POINTER(8)
H (4)
L (4)
D (4)
E (4)
C
A (4)
PORT4 LATCH BUFFER
PORT5 LATCH BUFFER
PORT6 LATCH BUFFER
PORT 0 BUFFER
PORT 7 LATCH BUFFER
PORT 2 LATCH BUFFER
PORT 1 BUFFER
PORT 3 LATCH BUFFER
80 P42
79 P43
78 STEREO IN
77 P51
76 P52
75 KEY ENABL
74 P60
73 P61
72 P62
71 P63
70 TUNER POWER IN
69 SCK
68 SO
67 SI
66 P30
65 P31
RESET
VSS
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64
S4 NC S3 S2 S1 S0 INT1 RESET CL1 CL2 P73 P72 P71 P70 CL STOP SK ALARM MILITARY P13 P12 P11 P10 P33 P32 VSS

Fig. 41

• PD4078C Pin Functions (Key · Display controller)

Pin No.	Pin Name	I/O	Function and Operation
1	P41	IN	Key Return Input.
2	P40	IN	
76	P52	IN	
77	P51	IN	
79	P43	IN	
80	P42	IN	
3	X2	OUT	Crystal oscillator (32.768KHz) connection terminal
4	X1	IN	
5	VLC3	IN	LCD reference voltage selection terminal
6	VLC2	IN	
7	VLC1	IN	
8	COM3	OUT	No Connection
9	COM2	OUT	
10	COM1	OUT	LCD Common output.
11	COMO	OUT	
12 | 22	S31 | S21	OUT | OUT	Segment signal output terminal that directly drives an LCD segment terminal (front electrode).
24 | 32	S20 | S12	OUT | OUT	
34 | 38	S11 | S7	OUT | OUT	

Pin No.	Pin Name	I/O	Function and Operation
23	NC		No Connection
33	VDD		Power supply terminal
39 | 46	S6 | S0	OUT | OUT	No Connection
47	INT1	IN	DK signal (125Hz) input terminal (KEH-9030SDK/WG)
48	RESET	IN	Reset input terminal. Active HIGH.
49	CL1	IN	System clock oscillation CR connection terminal
50	CL2	OUT	
51	P73	IN/OUT	Initial selection terminal. Just after reset, it is used for the following function selection as an input port. However, it changes to an output port after that.
52	P72	IN/OUT	
53	P71	IN/OUT	
54	P70	IN/OUT	

P73	P72	P71	P70	Function selection
H	—	—	—	Non quick release
L	—	—	—	Quick release
—	L	—	—	Scan key
—	—	L	H	Dolby NR B & C

Pin No.	Pin Name	I/O	Function and Operation
55	CL STOP	OUT	HIGH during clock stop
56	SK ALARM	OUT	For BEEP volume during SK alarm
57	MILITARY	OUT	Crystal oscillator (X901) oscillation stop use
58	P13	IN	Destination selection input terminal
59	P12	IN	
60	P11	IN	

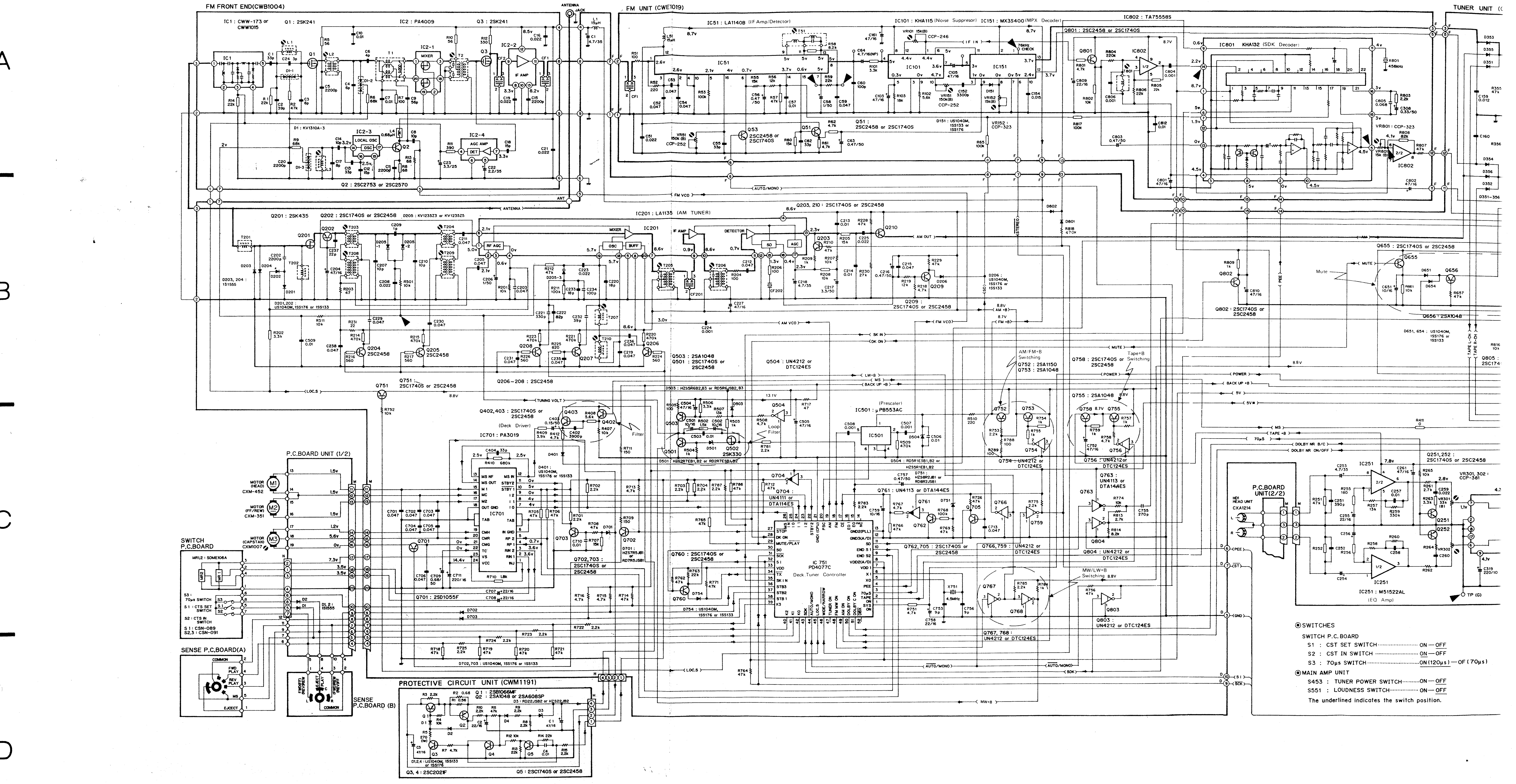
P13	P12	P11	Destination
H	H	H	US, CA, CS Model
H	H	L	ES Model
H	L	H	SDK/WG Model
H	L	L	EW Model
L	L	H	G Model

Pin No.	Pin Name	I/O	Function and Operation
61	P10	IN	No Connection
62	P33	OUT	Key scan, LED display DIGIT output terminal
63	P32	OUT	
65	P31	OUT	
66	P30	OUT	
64	VSS		GND
67	SI	IN	Serial data input terminal
68	SO	OUT	Serial data output terminal
69	SCK	IN/OUT	Serial clock I/O terminal
70	TUNER POWER IN	IN	LOW level input during tuner power on
71	P63	OUT	LED segment output terminal
72	P62	OUT	
73	P61	IN	Initial selection terminal
74	P60	IN	

P61	P60	Function selection
—	L	B. SKIP key
L	—	RPT key

Pin No.	Pin Name	I/O	Function and Operation
75	KEY ENABL	IN	Key accept with LOW (during ACC ON)
78	STEREO IN	IN	LOW during stereo

10. SCHEMATIC CIRCUIT DIAGRAM (KEH-9030SDK/WG)


A
B
C
D
FM FRONT END(CWB1004)
IC1 : CWW-173 or CWW1015
Q1 : 2SK241
IC2 : PA4009
Q3 : 2SK241
ANTENNA JACK
FM UNIT (CWE1019)
IC51 : LA1140B (IF Amp/Detector)
IC101 : KHA115 (Noise Suppresor)
IC151 : MX3S400 (MPX Decoder)
IC802 : TA75558S
Q801 : 2SC2458 or 2SC1740S
IC601 KHA132 (SDK Decoder)
TUNER UNIT
D1 : KV1310A-3
Q2 : 2SC2753 or 2SC2570
Q51 : 2SC2458 or 2SC1740S
Q53 2SC2458 or 2SC1740S
VR801 : CCP-323
IC802
Q201 : 2SK435
Q202 : 2SC1740S or 2SC2458
D205 : KV1235Z3 or KV1235Z5
IC201 : LA1135 (AM TUNER)
Q203, 210 : 2SC1740S or 2SC2458
Q209 : 2SC1740S or 2SC2458
Q655 : 2SC1740S or 2SC2458
Q802 : 2SC1740S or 2SC2458
Q656 : 2SA1048
D201,202 : US1040M, 1SS176 or 1SS133
Q206~208 : 2SC2458
Q751 : 2SC1740S or 2SC2458
Q503 : 2SA1048
Q501 : 2SC1740S or 2SC2458
Q504 : UN4212 or DTC124ES
IC501 : PB553AC (Prescaler)
AM/FM-B Switching
Q752 : 2SA1150
Q753 : 2SA1048
Q758 : 2SC1740S or 2SC2458
Tape-B Switching
Q755 : 2SA1048
Q402,403 : 2SC1740S or 2SC2458 (Deck Driver)
IC701 : PA3019
D401 : US1040M, 1SS176 or 1SS133
Q502 2SK330
Q754 : UN4212 or DTC124ES
Q756 : UN4212 or DTC124ES
Q763 : UN4113 or DTA144ES
P.C.BOARD UNIT (1/2)
MOTOR (HEAD) CXM-452
MOTOR (FF/REW) CXM-351
MOTOR (CAPSTAN) CXM1007
SWITCH P.C.BOARD
MRL2 : SOME106A
S3 : 70μs SWITCH
S1 : CST SET SWITCH
S2 : CTS IN SWITCH
S1 : CSN-089
S2,3 : CSN-091
SENSE P.C.BOARD(A)
FWD PLAY
REV PLAY
EJECT
SENSE P.C.BOARD (B)
Q701 : 2SD1055F
Q702,703 : 2SC1740S or 2SC2458
D701 : HZS7R5JB1 or RD7R5JSB1
Q704 : UN4111 or DTA114ES
Q761 : UN4113 or DTA144ES
IC751 PD4077C Deck Tuner Controller
Q760 : 2SC1740S or 2SC2458
D754 : US1040M, 1SS176 or 1SS133
Q762,705 : 2SC1740S or 2SC2458
Q766,759 : UN4212 or DTC124ES
MW/LW-B Switching
Q767, 768 : UN4212 or DTC124ES
Q803 : UN4212 or DTC124ES
Q804 : UN4212 or DTC124ES
D702,703 : US1040M, 1SS176 or 1SS133
PROTECTIVE CIRCUIT UNIT (CWM1191)
Q1 : 2SB1066MF
Q2 : 2SA1048 or 2SA608SP
D3 : RD22JSB2 or HZS22JB2
D1,2,4 : US1040M, 1SS133 or 1SS176
Q3, 4 : 2SC2021F
Q5 : 2SC1740S or 2SC2458
P.C.BOARD UNIT(2/2)
HEAD UNIT CXA1214
IC251 : M51522AL (EQ Amp)
Q251,252 : 2SC1740S or 2SC2458
VR301, 302 : CCP-381
TP (G)

◉SWITCHES

SWITCH P.C.BOARD

S1 : CST SET SWITCH ························ ON — OFF

S2 : CST IN SWITCH ························ ON — OFF

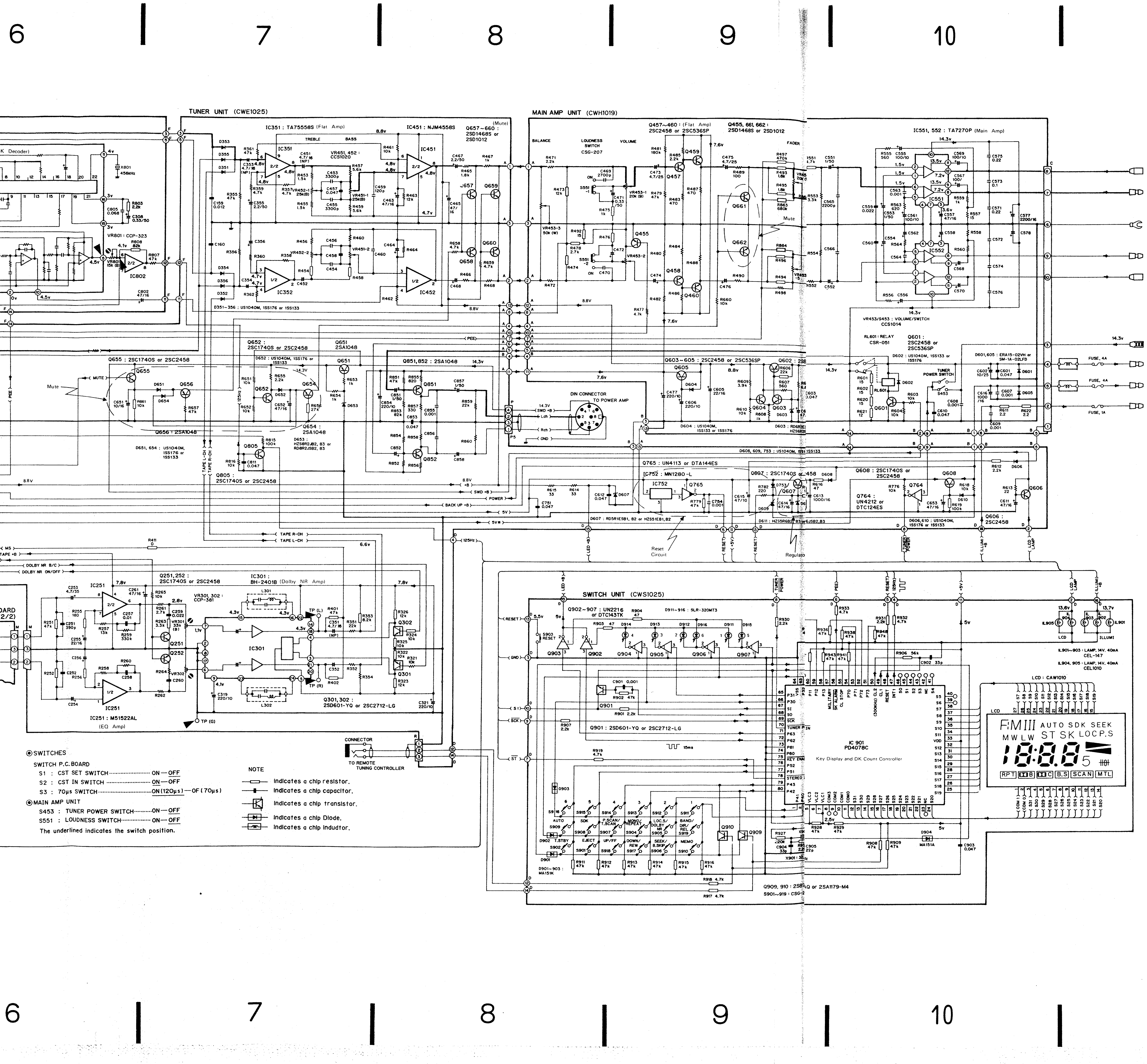
S3 : 70μs SWITCH ························ ON (120μs) — OF (70μs)

◉MAIN AMP UNIT

S453 : TUNER POWER SWITCH ·········· ON — OFF

S551 : LOUDNESS SWITCH ·········· ON — OFF

The underlined indicates the switch position.


6
7
8
9
10
11
12
TUNER UNIT (CWE1025)
MAIN AMP UNIT (CWH1019)
SWITCH UNIT (CWS1025)
IC351 : TA75558S (Flat Amp)
IC451 : NJM4558S
IC551, 552 : TA7270P (Main Amp)
IC251 : M51522AL
(EQ Amp)
IC301 : BH-2401B (Dolby NR Amp)
IC752 : MN1280-L
IC 901
PD4078C
Key Display and DK Count Controller
DIN CONNECTOR TO POWER AMP
CONNECTOR
TO REMOTE TUNING CONTROLLER
L-CH⊖
L-CH⊕
GND
R-CH⊕
R-CH⊖
AUTO ANTENNA +B
ACC +B
BACK UP +B
ILLUMI +B
FUSE, 4A
FUSE, 1A
LCD : CAW1010
Reset Circuit
Regulato

◉SWITCHES

SWITCH P.C.BOARD

S1 : CST SET SWITCH………… ON — OFF

S2 : CST IN SWITCH………… ON — OFF

S3 : 70μs SWITCH………… ON (120μs) — OF (70μs)

◉MAIN AMP UNIT

S453 : TUNER POWER SWITCH………… ON — OFF

S551 : LOUDNESS SWITCH………… ON — OFF

The underlined indicates the switch position.

NOTE

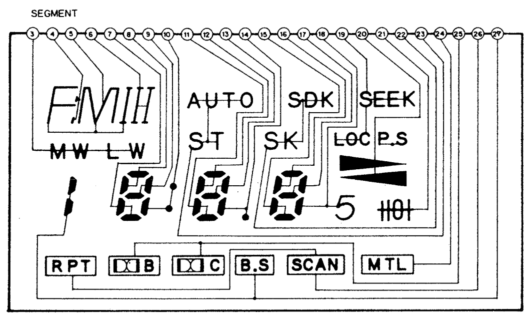
Indicates a chip resistor.

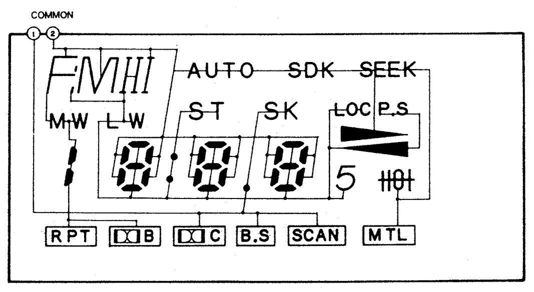
Indicates a chip capacitor.

Indicates a chip transistor.

Indicates a chip Diode.

Indicates a chip indudtor.


SEGMENT
FMIII
AUTO
SDK
SEEK
MW
LW
ST
SK
LOC
P.S
5
RPT
B
C
B.S
SCAN
MTL

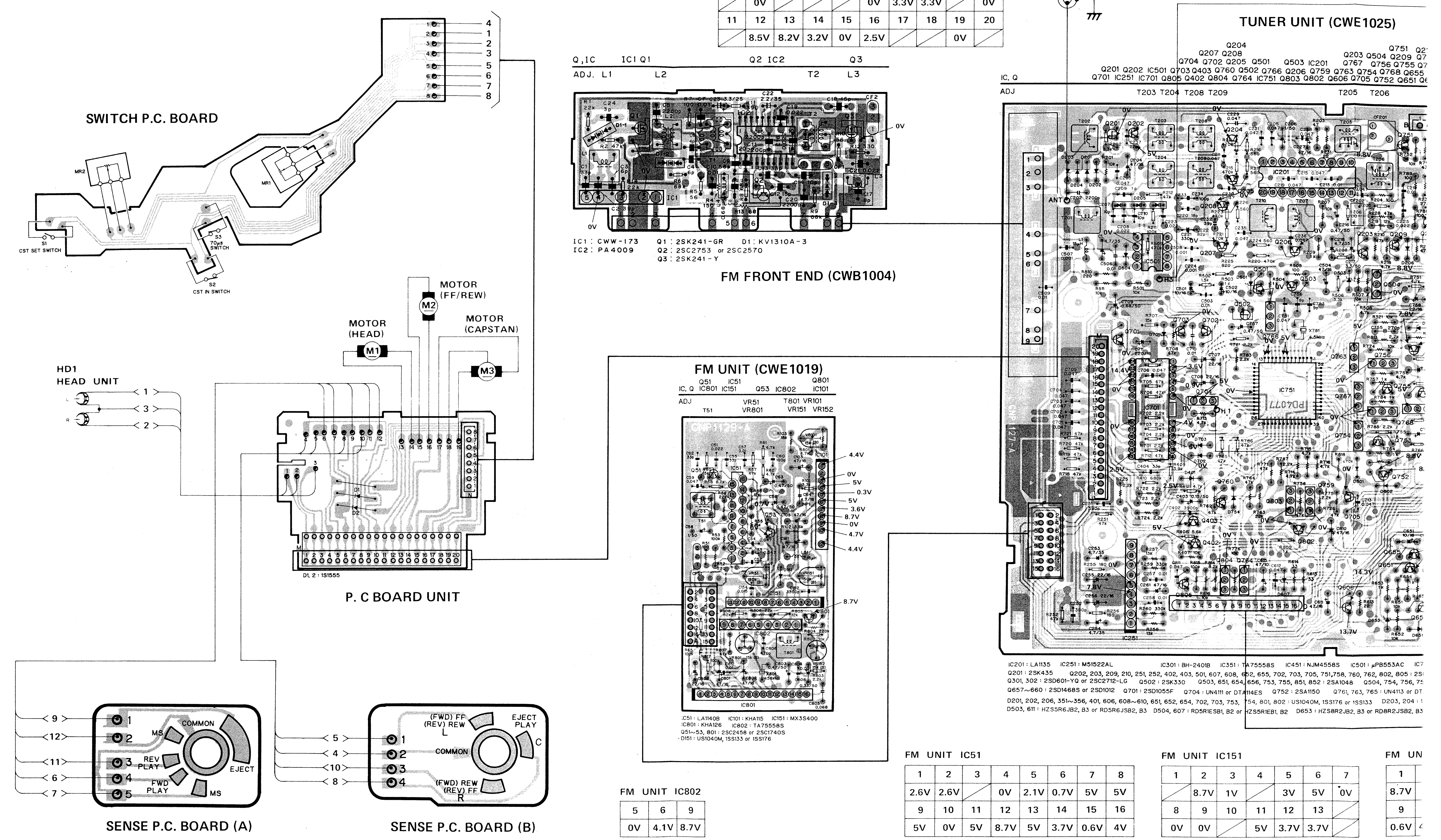

COMMON
FMIII
AUTO
SDK
SEEK
MW
LW
ST
SK
LOC
P.S
5
RPT
B
C
B.S
SCAN
MTL

A
B
C
D

11. CONNECTION DIAGRAM (KEH-9030SDK/WG)

FM FRONT END IC2

1	2	3	4	5	6	7	8	9	10
	0V				0V	3.3V	3.3V		0V
11	12	13	14	15	16	17	18	19	20
	8.5V	8.2V	3.2V	0V	2.5V			0V	


1
2
3
4
5
6
A
B
C
D
SWITCH P.C. BOARD
MR1
MR2
S1
CST SET SWITCH
S3
70μs SWITCH
S2
CST IN SWITCH
MOTOR (FF/REW)
M2
MOTOR (HEAD)
M1
MOTOR (CAPSTAN)
M3
HD1
HEAD UNIT
L
R
D1
D2
DL 2 : 1S1555
P. C BOARD UNIT
SENSE P.C. BOARD (A)
COMMON
MS
REV PLAY
FWD PLAY
EJECT
SENSE P.C. BOARD (B)
(FWD) FF
(REV) REW
L
EJECT
PLAY
C
COMMON
(FWD) REW
(REV) FF
R
Q,IC
IC1 Q1
Q2 IC2
Q3
ADJ. L1
L2
T2
L3
0V
FM FRONT END (CWB1004)
FM UNIT (CWE1019)
IC. Q
Q51
IC801
IC51
IC151
Q53
IC802
Q801
IC101
ADJ
T51
VR51
VR801
T801 VR101
VR151 VR152
4.4V
0V
5V
0.3V
5V
3.6V
8.7V
0V
4.7V
4.4V
8.7V
ANTENNA JACK
ANT
TUNER UNIT (CWE1025)
IC. Q
Q201 Q202 IC501 Q703 Q403 Q760 Q502 Q766 Q206 Q759 Q763 Q754 Q768 Q655
Q701 IC251 IC701 Q805 Q402 Q804 Q764 IC751 Q803 Q802 Q606 Q705 Q752 Q651
Q704 Q702 Q205 Q501 Q503 IC201 Q767 Q756 Q755
Q207 Q208 Q203 Q504 Q209
Q204 Q751
ADJ
T203 T204 T208 T209 T205 T206
IC751
PD4077
IC251
13.7V
14.3V

IC1 : CWW-173　Q1 : 2SK241-GR　D1 : KV1310A-3
IC2 : PA4009　Q2 : 2SC2753 or 2SC2570
Q3 : 2SK241-Y

IC51 : LA1140B　IC101 : KHA115　IC151 : MX3S400
IC801 : KHA126　IC802 : TA7555BS
Q51~53, 801 : 2SC2458 or 2SC1740S
D151 : US1040M, 1SS133 or 1SS176

IC201 : LA1135　IC251 : M51522AL　IC301 : BH-2401B　IC351 : TA75558S　IC451 : NJM4558S　IC501 : μPB553AC　IC7
Q201 : 2SK435　Q202, 203, 209, 210, 251, 252, 402, 403, 501, 607, 608, 652, 655, 702, 703, 705, 751,758, 760, 762, 802, 805 : 2S
Q301, 302 : 2SD601-YQ or 2SC2712-LG　Q502 : 2SK330　Q503, 651, 654, 656, 753, 755, 851, 852 : 2SA1048　Q504, 754, 756, 75
Q657~660 : 2SD1468S or 2SD1012　Q701 : 2SD1055F　Q704 : UN4111 or DTA114ES　Q752 : 2SA1150　Q761, 763, 765 : UN4113 or DT
D201, 202, 206, 351~356, 401, 606, 608~610, 651, 652, 654, 702, 703, 753, 754, 801, 802 : US1040M, 1SS176 or 1SS133　D203, 204 : 1
D503, 611 : HZS5R6JB2, B3 or RD5R6JSB2, B3　D504, 607 : RD5R1ESB1, B2 or HZS5R1EB1, B2　D653 : HZS8R2JB2, B3 or RD8R2JSB2, B3

FM UNIT IC802

5	6	9
0V	4.1V	8.7V

FM UNIT IC51

1	2	3	4	5	6	7	8
2.6V	2.6V		0V	2.1V	0.7V	5V	5V
9	10	11	12	13	14	15	16
5V	0V	5V	8.7V	5V	3.7V	0.6V	4V

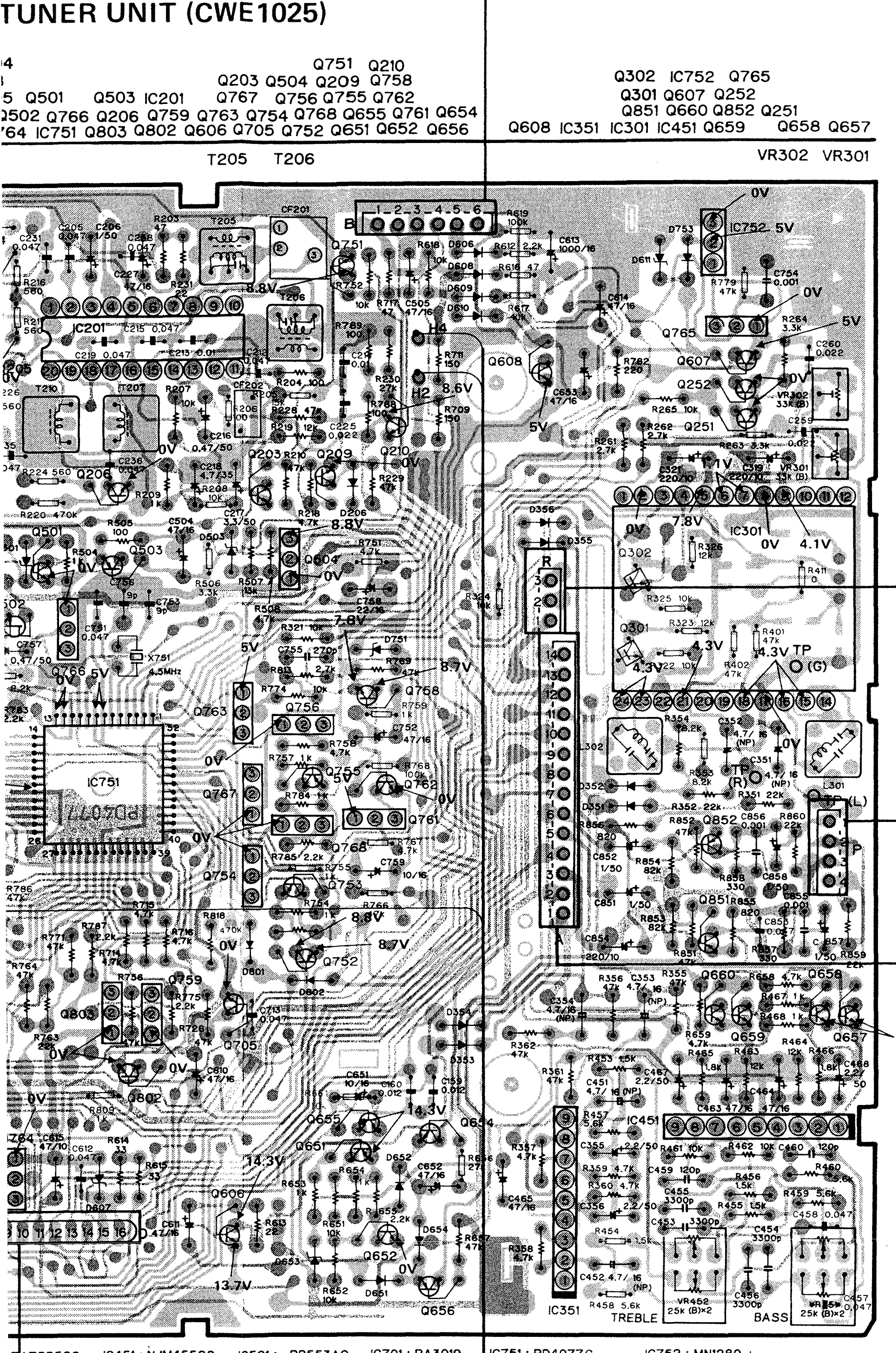
FM UNIT IC151

1	2	3	4	5	6	7
	8.7V	1V		3V	5V	0V
8	9	10	11	12	13	
0V	0V		5V	3.7V	3.7V	

FM UN

1
8.7V
9
0.6V

TUNER UNIT (CWE1025)


Q751 Q210
Q203 Q504 Q209 Q758
5 Q501 Q503 IC201 Q767 Q756 Q755 Q762
502 Q766 Q206 Q759 Q763 Q754 Q768 Q655 Q761 Q654
64 IC751 Q803 Q802 Q606 Q705 Q752 Q651 Q652 Q656
Q302 IC752 Q765
Q301 Q607 Q252
Q851 Q660 Q852 Q251
Q608 IC351 IC301 IC451 Q659 Q658 Q657
T205 T206
VR302 VR301
TREBLE
BASS

A75558S IC451 : NJM4558S IC501 : μPB553AC IC701 : PA3019 IC751 : PD4077C IC752 : MN1280-L

52, 655, 702, 703, 705, 751,758, 760, 762, 802, 805 : 2SC1740S or 2SC2458 Q204~208, 606 : 2SC2458

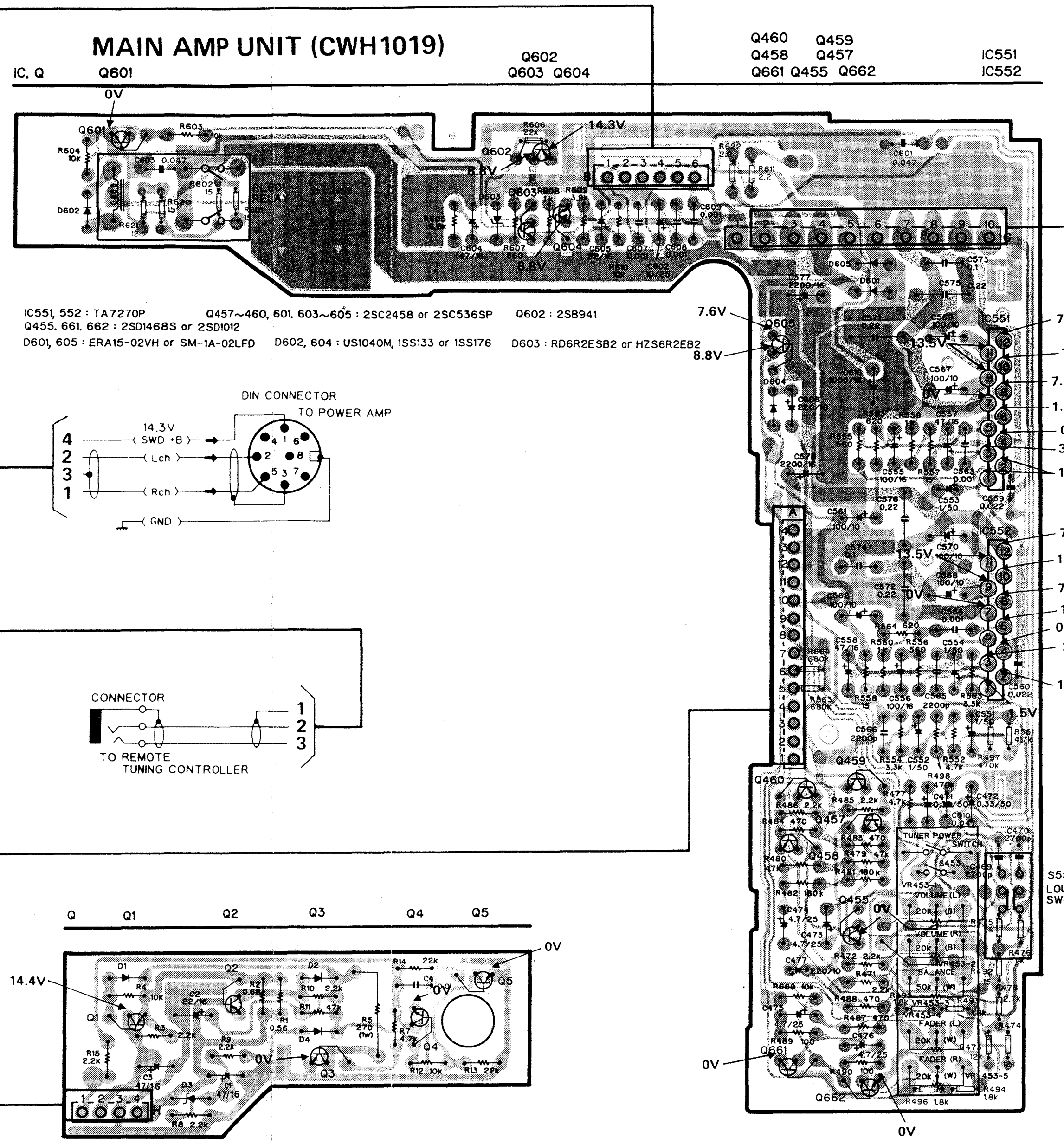
4, 656, 753, 755, 851, 852 : 2SA1048 Q504, 754, 756, 759, 764, 766~768, 803, 804 : UN4212 or DTC124ES

A114ES Q752 : 2SA1150 Q761, 763, 765 : UN4113 or DTA144ES

54, 801, 802 : US1040M, 1SS176 or 1SS133 D203, 204 : 1S1555 D205 : KV1235Z3 or KV1235Z5 D501 : HZS2R7EB1, B2 or RD2R7ESB1, B2

r HZS5R1EB1, B2 D653 : HZS8R2JB2, B3 or RD8R2JSB2, B3 D701 : HZS7R5JB1 or RD7R5JSB1 D751 : HZS8R2JB1 or RD8R2JSB1

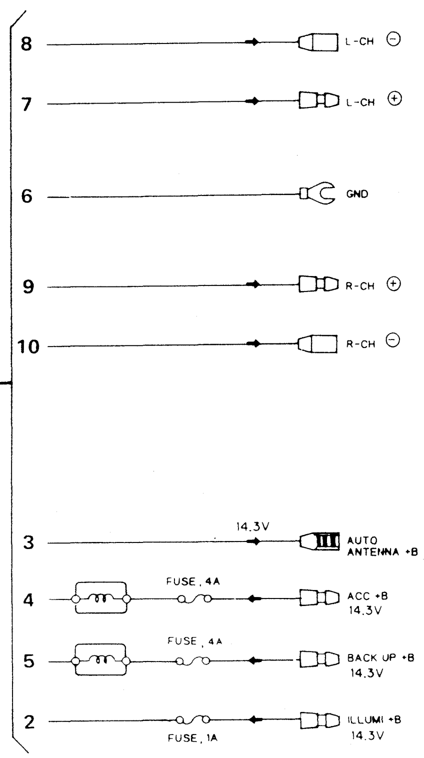
MAIN AMP UNIT (CWH1019)


IC, Q
Q601
Q602
Q603 Q604
Q460 Q459
Q458 Q457
Q661 Q455 Q662
IC551
IC552
0V
14.3V
8.8V
7.6V
8.8V
7.2V
14.3V
7.2V
1.5V
0V
3.6V
1.5V
7.2V
14.3V
7.2V
1.5V
0V
3.6V
1.5V
TUNER POWER SWITCH
VOLUME
BALANCE
FADER
S551 LOUDNESS SWITCH
0V
0V
DIN CONNECTOR
TO POWER AMP
4
2
3
1
14.3V
SWD +B
Lch
Rch
GND
CONNECTOR
1
2
3
TO REMOTE TUNING CONTROLLER
Q
Q1
Q2
Q3
Q4
Q5
14.4V
0V
0V

IC551, 552 : TA7270P Q457~460, 601, 603~605 : 2SC2458 or 2SC536SP Q602 : 2SB941
Q455, 661, 662 : 2SD1468S or 2SD1012
D601, 605 : ERA15-02VH or SM-1A-02LFD D602, 604 : US1040M, 1SS133 or 1SS176 D603 : RD6R2ESB2 or HZS6R2EB2

Q1 : 2SB1066MF Q2 : 2SA1048 or 2SA608SP Q3, 4 : 2SC2021F
Q5 : 2SC1740S or 2SC2458
D1, 2, 4 : US1040M, 1SS133 or 1SS176 D3 : RD22JSB2 or HZS22JB2

PROTECTIVE CIRCUIT UNIT (CWM1191)


8
L-CH ⊖
7
L-CH ⊕
6
GND
9
R-CH ⊕
10
R-CH ⊖
3
14.3V
AUTO ANTENNA +B
4
FUSE, 4A
ACC +B
14.3V
5
FUSE, 4A
BACK UP +B
14.3V
2
FUSE, 1A
ILLUMI +B
14.3V

TUNER UNIT IC201

1	2	3	4	5	6	7	8	9	10
5V	2.1V	0.6V	0V	0V	2.1V	8.6V	8.6V	0.9V	8.6V
11	12	13	14	15	16	17	18	19	20
0.7V	0V	2.3V	8.6V	1.3V	0.4V	2.3V	5.7V	5.7V	3.0V

TUNER UNIT IC451

1	2	3	4	5	6	7	8	9
8.8V	4.8V	4.8V	4.8V	0V	4.8V	4.8V	4.8V	

TUNER UNIT IC351

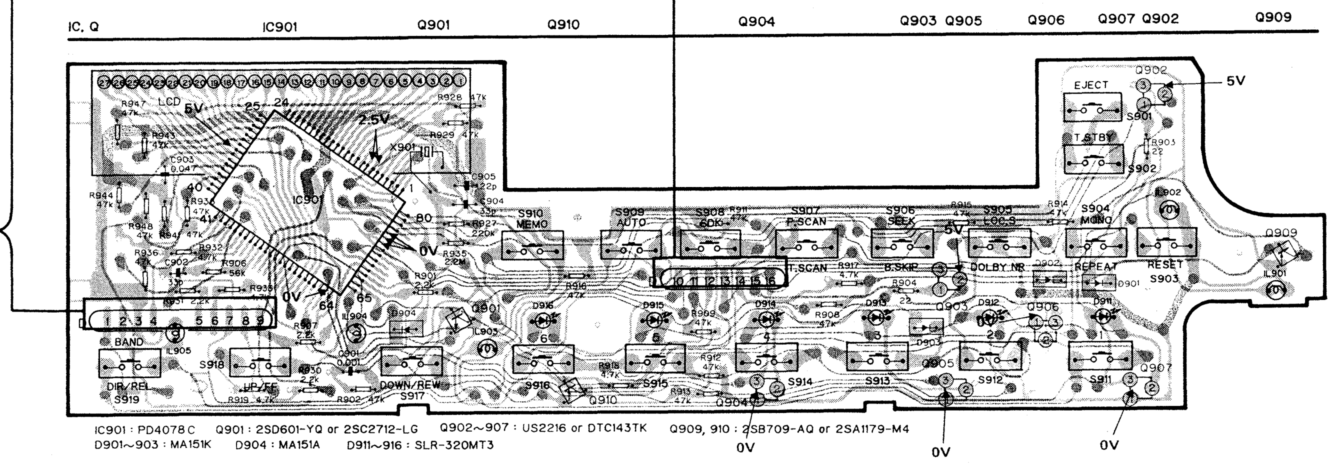
1	2	3	4	5	6	7	8	9
	4.8V	4.7V	4.7V	0V	4.8V	4.8V	4.8V	8.8V

4	5	6	7
	3V	5V	0V
11	12	13	
5V	3.7V	3.7V	

FM UNIT IC801

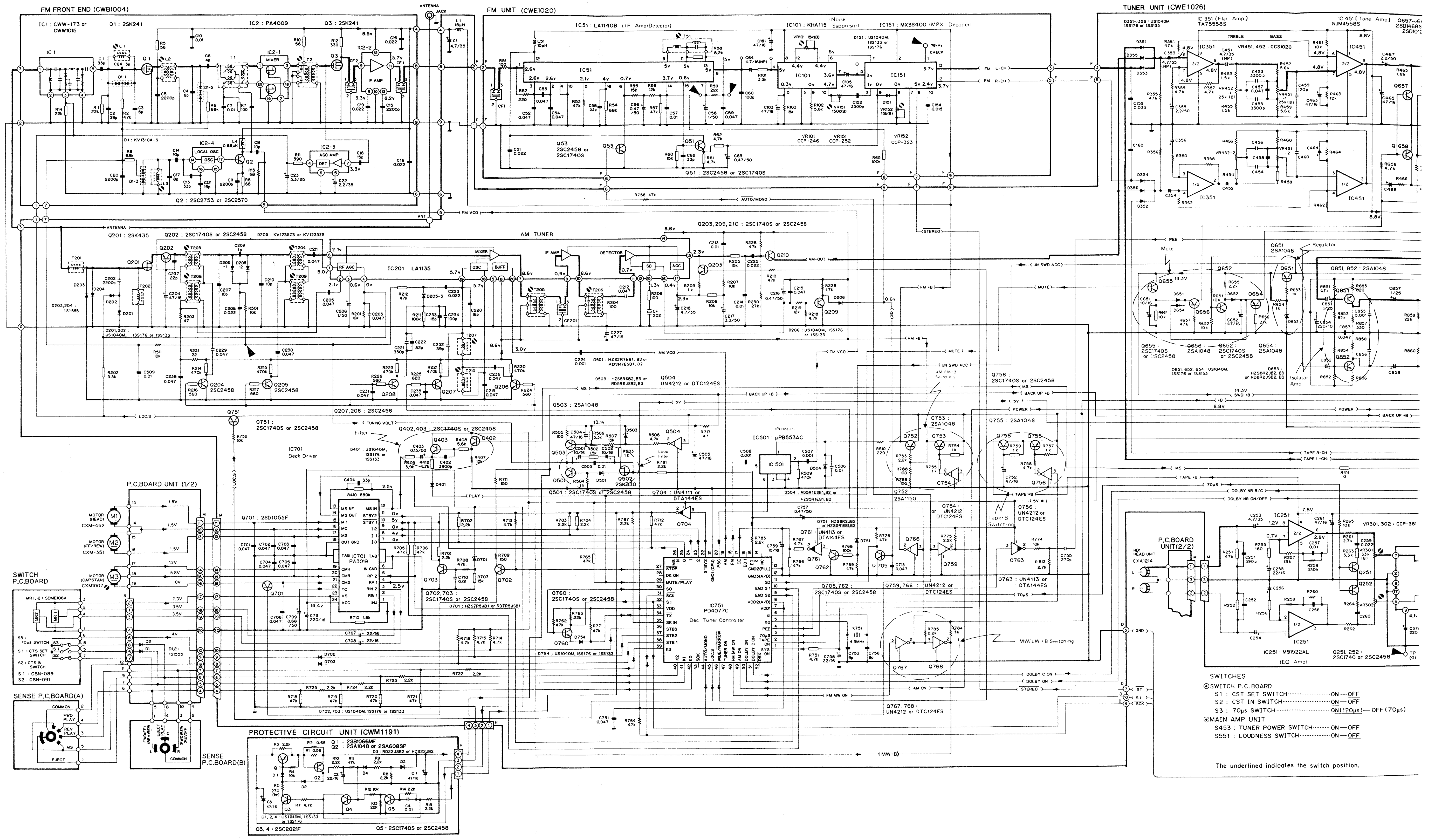
1	2	3	4	5	6	7	8
8.7V	0V	0V	4.5V	4.5V	5V	1.9V	5V
9	10	11	12	13	14	15	16
0.6V	4.5V	4V		0V	2.2V	3V	3V

SWITCH UNIT (CWS1025)


IC, Q
IC901
Q901
Q910
Q904
Q903 Q905
Q906
Q907 Q902
Q909
LCD
5V
2.5V
EJECT
5V
T.STBY
MEMO
AUTO
P.SCAN
SEEK
LOCAL
DOLBY NR
MONO
REPEAT
RESET
BAND
DIR/REL
UP/FF
DOWN/REW
T.SCAN
B.SKIP
0V
0V
0V

IC901 : PD4078C Q901 : 2SD601-YQ or 2SC2712-LG Q902~907 : US2216 or DTC143TK Q909, 910 : 2SB709-AQ or 2SA1179-M4
D901~903 : MA151K D904 : MA151A D911~916 : SLR-320MT3

12. SCHEMATIC CIRCUIT DIAGRAM (KEH-9030/EW)


1
2
3
4
5
6
A
B
C
D
FM FRONT END (CWB1004)
IC1 : CWW-173 or CWW1015
Q1 : 2SK241
IC2 : PA4009
Q3 : 2SK241
IC2-1 MIXER
IC2-2 IF AMP
IC2-4 LOCAL OSC
IC2-3 AGC AMP
D1 : KV1310A-3
Q2 : 2SC2753 or 2SC2570
ANTENNA JACK
FM UNIT (CWE1020)
IC51 : LA1140B (IF Amp/Detector)
IC101 : KHA115 (Noise Suppresor)
IC151 : MX3S400 (MPX Decoder)
76kHz CHECK
Q53 : 2SC2458 or 2SC1740S
Q51 : 2SC2458 or 2SC1740S
VR101 CCP-246
VR151 CCP-252
VR152 CCP-323
FM L-CH
FM R-CH
TUNER UNIT (CWE1026)
IC351 (Flat Amp) TA75558S
IC451 (Tone Amp) NJM4558S
TREBLE
BASS
VR451, 452 : CCS1020
AM TUNER
Q201 : 2SK435
Q202 : 2SC1740S or 2SC2458
D205 : KV1235Z3 or KV1235Z5
Q203, 209, 210 : 2SC1740S or 2SC2458
IC201 LA1135
MIXER
RF AGC
OSC
BUFF
IF AMP
DETECTOR
SD
AGC
AM-OUT
Q204 2SC2458
Q205 2SC2458
Q207, 208 : 2SC2458
Mute
Regulator
Isolator Amp
Q651 2SA1048
Q851, 852 : 2SA1048
Q655 : 2SC1740S or 2SC2458
Q656 : 2SA1048
Q652 : 2SC1740S or 2SC2458
Q654 : 2SA1048
Q653 : HZS8R2JB2 B3 or RD8R2JSB2 B3
AUTO/MONO
STEREO
FM VCO
AM VCO
UN SWD ACC
MUTE
FM +B
AM +B
BACK UP +B
5V
POWER
MS
PEE
14.3V SWD +B
8.8V
TAPE R-CH
TAPE L-CH
TAPE +B
70µS
DOLBY NR B/C
DOLBY NR ON/OFF
LOC.S
TUNING VOLT
PLAY
Q751 : 2SC1740S or 2SC2458
Filter
Q402, 403 : 2SC1740S or 2SC2458
IC701 Deck Driver
IC701 PA3019
Q701 : 2SD1055F
Q702, 703 : 2SC1740S or 2SC2458
P.C.BOARD UNIT (1/2)
MOTOR (HEAD) CXM-452 M1
MOTOR (FF/REW) CXM-351 M2
MOTOR (CAPSTAN) CXM1007 M3
SWITCH P.C.BOARD
MR1, 2 : SDME106A
S3 : 70µs SWITCH
S1 : CST SET SWITCH
S2 : CST IN SWITCH
S1 : CSN-089
S2 : CSN-091
SENSE P.C.BOARD(A)
COMMON
FWD PLAY
REV PLAY
MS
EJECT
SENSE P.C.BOARD(B)
PROTECTIVE CIRCUIT UNIT (CWM1191)
Q1 : 2SB1066MF
Q2 : 2SA1048 or 2SA608SP
Q3, 4 : 2SC2021F
Q5 : 2SC1740S or 2SC2458
Q503 : 2SA1048
Q501 : 2SC1740S or 2SC2458
Q502 2SK330
Loop Filter
IC501 : µPB553AC (Prescaler)
Q504 : UN4212 or DTC124ES
Q704 : UN4111 or DTA144ES
Q760 : 2SC1740S or 2SC2458
IC751 PD4077C Dec Tuner Controller
Q752 : 2SA1150
Q753 : 2SA1048
Q758 : 2SC1740S or 2SC2458
Q755 : 2SA1048
Q754 : UN4212 or DTC124ES
Q756 : UN4212 or DTC124ES
Q761 : UN4113 or DTA144ES
Q763 : UN4113 or DTA144ES
Q705, 762 : 2SC1740S or 2SC2458
Q759, 766 : UN4212 or DTC124ES
Q767, 768 : UN4212 or DTC124ES
AM FM +B Switching
Tape +B Switching
MW/LW +B Switching
AM ON
FM MW ON
DOLBY C ON
DOLBY ON
MW +B
GND
ST
SI
SCK
P.C.BOARD UNIT (2/2)
HEAD UNIT CXA1214
IC251
VR301, 302 : CCP-381
IC251 : M51522AL (EQ Amp)
Q251, 252 : 2SC1740 or 2SC2458
TP (G)

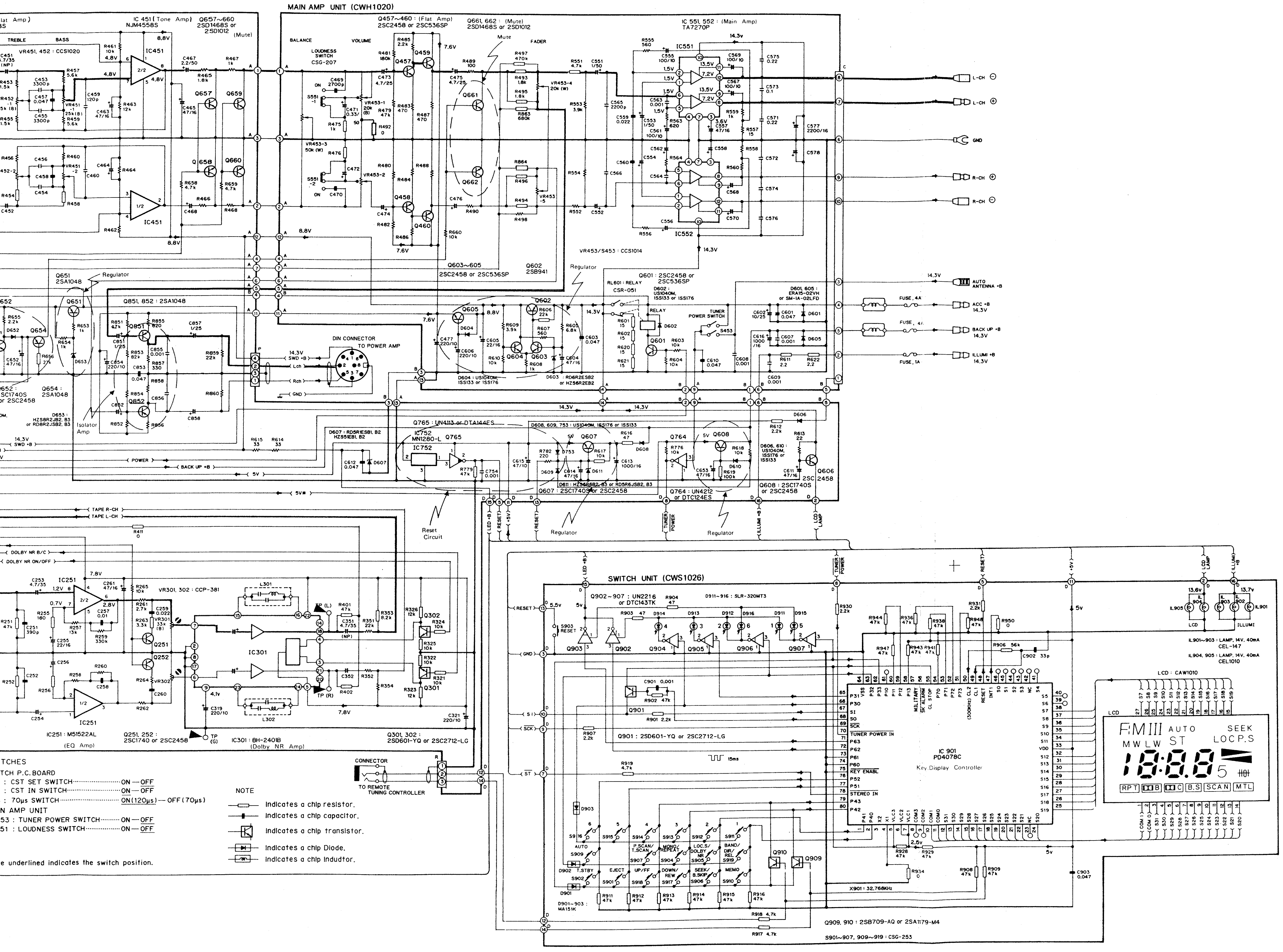
SWITCHES

⊙SWITCH P.C.BOARD
S1 : CST SET SWITCH……………ON — OFF
S2 : CST IN SWITCH……………ON — OFF
S3 : 70µs SWITCH……………ON(120µs) — OFF(70µs)

⊙MAIN AMP UNIT
S453 : TUNER POWER SWITCH……ON — OFF
S551 : LOUDNESS SWITCH……………ON — OFF

The underlined indicates the switch position.

7 8 9 10 11 12


MAIN AMP UNIT (CWH1020)
IC 451 (Tone Amp) NJM4558S
Q657~660 2SD1468S or 2SD1012 (Mute)
VR451, 452 : CCS1020
TREBLE
BASS
BALANCE
VOLUME
LOUDNESS SWITCH CSG-207
Q457~460 : (Flat Amp) 2SC2458 or 2SC536SP
Q661, 662 : (Mute) 2SD1468S or 2SD1012
Mute
FADER
IC 551, 552 : (Main Amp) TA7270P
IC551
IC552
IC451
VR453/S453 : CCS1014
Q603~605 2SC2458 or 2SC536SP
Q602 2SB941
Regulator
Q601 : 2SC2458 or 2SC536SP
RL601 : RELAY CSR-051
D602 : US1040M, 1SS133 or 1SS176
D601, 605 : ERA15-02VH or SM-1A-02LFD
TUNER POWER SWITCH
RELAY
Q651 2SA1048
Q851, 852 : 2SA1048
DIN CONNECTOR TO POWER AMP
Q652 2SC1740S or 2SC2458
Q654 2SA1048
D653 : HZS8R2JB2, B3 or RD8R2JS82, B3
Isolator Amp
D604 : US1040M, 1SS133 or 1SS176
D603 : RD6R2ES82 or HZS6R2EB2
D607 : RD5R1ES8L B2 HZS5IEBL B2
IC752 MN1280-L
Q765 : UN4113 or DTA144ES
D608, 609, 753 : US1040M, 1SS176 or 1SS133
D606, 610 : US1040M, 1SS176 or 1SS133
Q608 : 2SC1740S or 2SC2458
Q607 : 2SC1740S or 2SC2458
Q764 : UN4212 or DTC124ES
D611 : HZS6R2B2, B3 or RD5R6JS82, B3
Reset Circuit
Regulator
L-CH ⊖
L-CH ⊕
GND
R-CH ⊕
R-CH ⊖
AUTO ANTENNA +B
ACC +B 14.3V
BACK UP +B 14.3V
ILLUMI +B 14.3V
FUSE, 4A
FUSE, 1A
POWER
BACK UP +B
5V
TAPE R-CH
TAPE L-CH
DOLBY NR B/C
DOLBY NR ON/OFF
IC251 : M51522AL (EQ Amp)
Q251, 252 : 2SC1740 or 2SC2458
TP (G)
IC301 : BH-2401B (Dolby NR Amp)
VR301, 302 : CCP-381
Q301, 302 : 2SD601-YQ or 2SC2712-LG
TP (L)
TP (R)
CONNECTOR
TO REMOTE TUNING CONTROLLER
SWITCH UNIT (CWS1026)
Q902~907 : UN2216 or DTC143TK
D911~916 : SLR-320MT3
RESET
GND
SI
SCK
ST
LED +B
TUNER POWER
ILLUMI
LCD LAMP
Q901 : 2SD601-YQ or 2SC2712-LG
IC 901 PD4078C Key Display Controller
TUNER POWER IN
KEY ENABL
STEREO IN
MILITARY
X901 : 32.768kHz
IL901~903 : LAMP, 14V, 40mA CEL-147
IL904, 905 : LAMP, 14V, 40mA CEL1010
LCD : CAW1010
AUTO
T.STBY
EJECT
P.SCAN/1.SCAN
UP/FF
MONO/REPEAT
DOWN/REW
LOC.S/DOLBY NR
SEEK/B.SKIP
BAND/DIR/REL
MEMO
D901~903 : MA151K
Q909, 910 : 2SB709-AQ or 2SA1179-M4
S901~907, 909~919 : CSG-253
FMIII AUTO SEEK
MW LW ST LOC P.S
RPT B C B.S SCAN MTL

TCHES
TCH P.C.BOARD
: CST SET SWITCH··························ON — OFF
: CST IN SWITCH····························ON — OFF
: 70μs SWITCH·····························ON(120μs) — OFF(70μs)
N AMP UNIT
53 : TUNER POWER SWITCH·········ON — OFF
51 : LOUDNESS SWITCH················ON — OFF

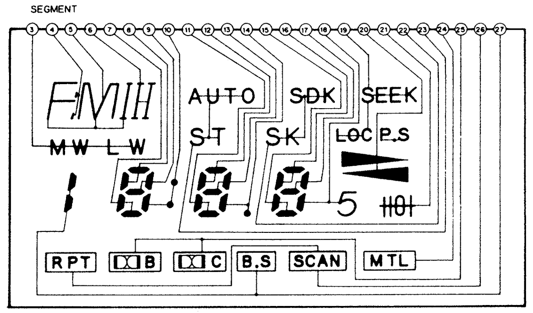
e underlined indicates the switch position.

NOTE

Indicates a chip resistor.
Indicates a chip capacitor.
Indicates a chip transistor.
Indicates a chip Diode.
Indicates a chip indudtor.

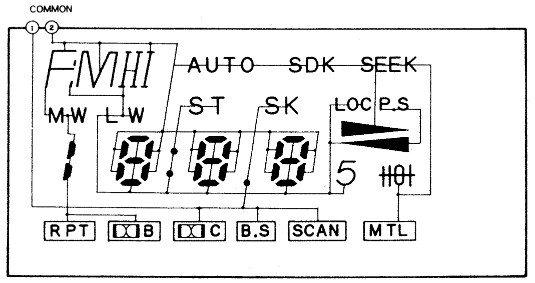
A

B


SEGMENT
FMIII
AUTO
SDK
SEEK
MW
LW
ST
SK
LOC P.S
5
RPT
B
C
B.S
SCAN
MTL

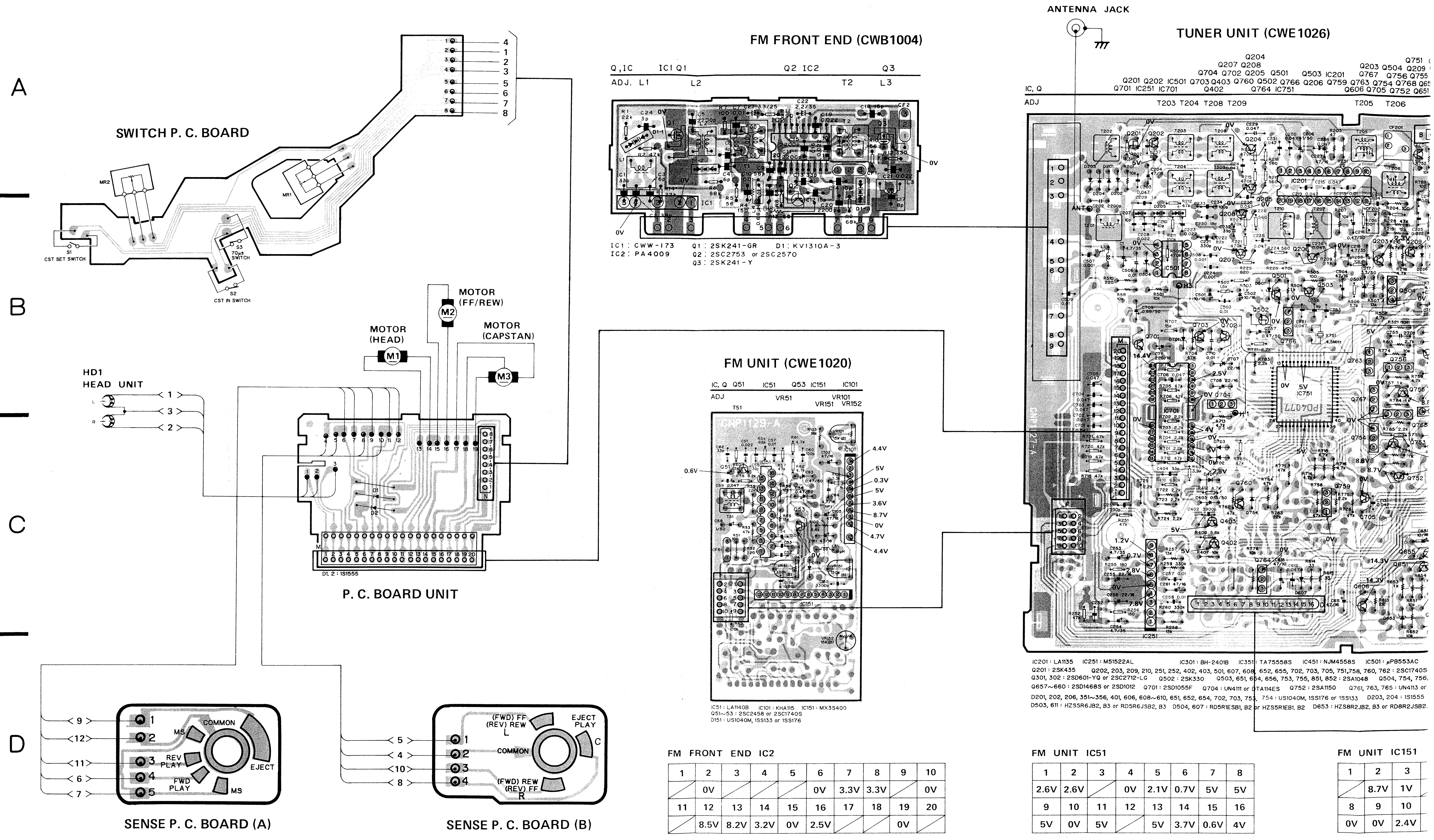
C

D


COMMON
FMIII
AUTO
SDK
SEEK
MW
LW
ST
SK
LOC P.S
5
RPT
B
C
B.S
SCAN
MTL

7 8 9 10 11 12

13. CONNECTION DIAGRAM (KEH-9030/EW)


1
2
3
4
5
6
A
B
C
D
SWITCH P. C. BOARD
MR1
MR2
S1 CST SET SWITCH
S2 CST IN SWITCH
S3 70μs SWITCH
HD1 HEAD UNIT
L
R
MOTOR (HEAD)
M1
MOTOR (FF/REW)
M2
MOTOR (CAPSTAN)
M3
P. C. BOARD UNIT
D1, 2 : 1S1555
FM FRONT END (CWB1004)
Q, IC ADJ.
IC1 Q1 L1 L2
Q2 IC2 T2
Q3 L3
0V
FM UNIT (CWE1020)
IC, Q ADJ
Q51 T51
IC51 VR51
Q53 IC151 VR151
IC101 VR101 VR152
0.6V
4.4V
5V
0.3V
5V
3.6V
8.7V
0V
4.7V
4.4V
ANTENNA JACK
TUNER UNIT (CWE1026)
IC, Q ADJ
T203 T204 T208 T209
T205 T206
14.4V
2.5V
5V
8.8V
8.7V
14.3V
7.8V
2.8V
1.2V
0.7V
IC751
PD4077
SENSE P. C. BOARD (A)
COMMON
MS
REV PLAY
FWD PLAY
EJECT
SENSE P. C. BOARD (B)
(FWD) FF (REV) REW
EJECT PLAY
COMMON
(FWD) REW (REV) FF
L
C
R

IC1 : CWW-173 Q1 : 2SK241-GR D1 : KV1310A-3
IC2 : PA4009 Q2 : 2SC2753 or 2SC2570
Q3 : 2SK241-Y

IC51 : LA1140B IC101 : KHA115 IC151 : MX3S400
Q51~53 : 2SC2458 or 2SC1740S
D151 : US1040M, 1SS133 or 1SS176

IC201 : LA1135 IC251 : M51522AL IC301 : BH-2401B IC351 : TA75558S IC451 : NJM4558S IC501 : μPB553AC
Q201 : 2SK435 Q202, 203, 209, 210, 251, 252, 402, 403, 501, 607, 608, 652, 655, 702, 703, 705, 751,758, 760, 762 : 2SC1740S
Q301, 302 : 2SD601-YQ or 2SC2712-LG Q502 : 2SK330 Q503, 651, 654, 656, 753, 755, 851, 852 : 2SA1048 Q504, 754, 756,
Q657~660 : 2SD1468S or 2SD1012 Q701 : 2SD1055F Q704 : UN4111 or DTA114ES Q752 : 2SA1150 Q761, 763, 765 : UN4113 or
D201, 202, 206, 351~356, 401, 606, 608~610, 651, 652, 654, 702, 703, 753, 754 : US1040M, 1SS176 or 1SS133 D203, 204 : 1S1555
D503, 611 : HZS5R6JB2, B3 or RD5R6JSB2, B3 D504, 607 : RD5R1ESB1, B2 or HZS5R1EB1, B2 D653 : HZS8R2JB2, B3 or RD8R2JSB2.

FM FRONT END IC2

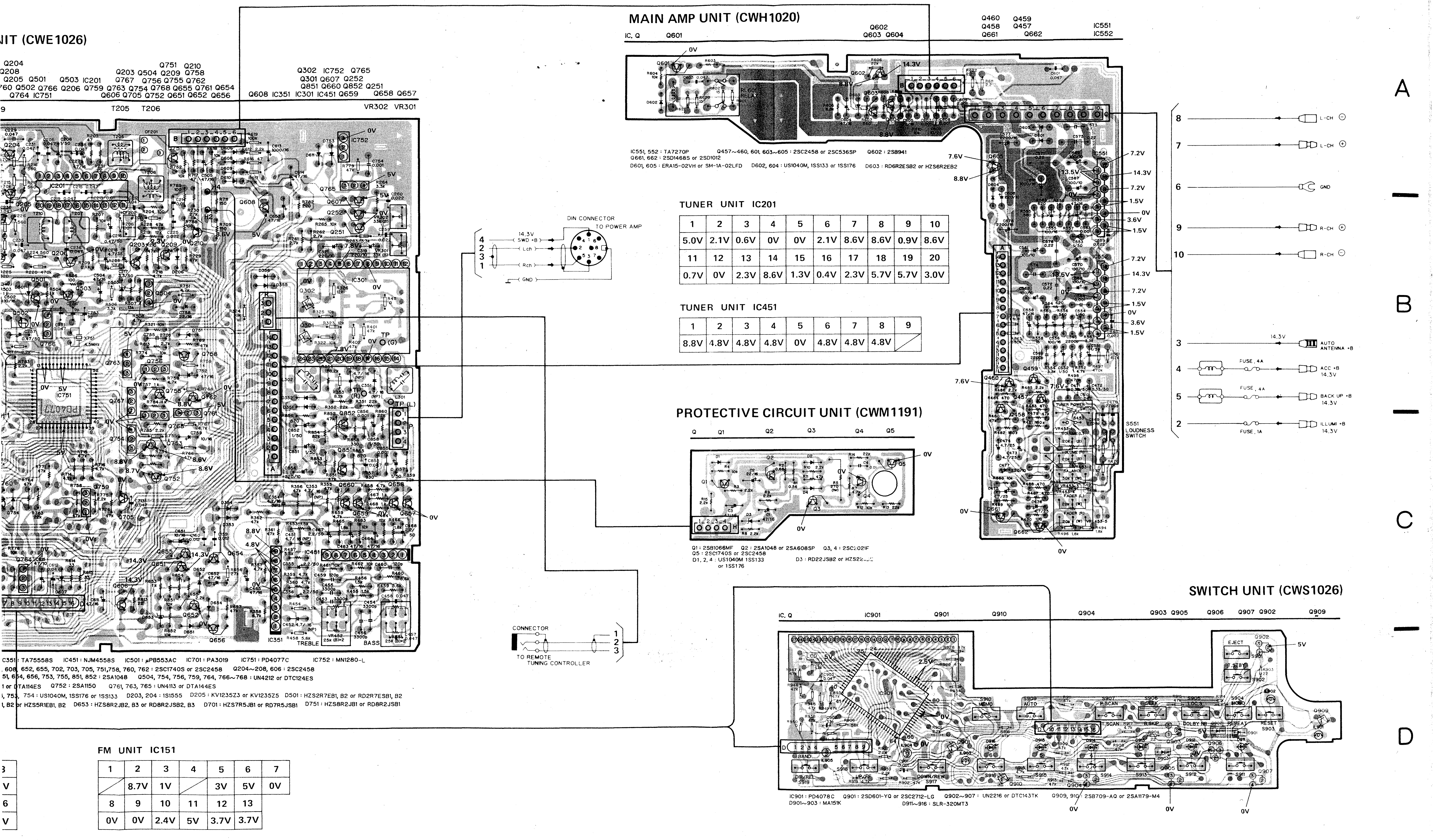
1	2	3	4	5	6	7	8	9	10
	0V				0V	3.3V	3.3V		0V
11	12	13	14	15	16	17	18	19	20
	8.5V	8.2V	3.2V	0V	2.5V			0V	

FM UNIT IC51

1	2	3	4	5	6	7	8
2.6V	2.6V		0V	2.1V	0.7V	5V	5V
9	10	11	12	13	14	15	16
5V	0V	5V		5V	3.7V	0.6V	4V

FM UNIT IC151

1	2	3
	8.7V	1V
8	9	10
0V	0V	2.4V


7
8
9
10
11
12
A
B
C
D
IT (CWE1026)
Q204 Q208 Q205 Q501 Q503 IC201 Q502 Q766 Q206 Q759 Q764 IC751
Q751 Q210 Q203 Q504 Q209 Q758 Q767 Q756 Q755 Q762 Q763 Q754 Q768 Q655 Q761 Q654 Q606 Q705 Q752 Q651 Q652 Q656
T205 T206
Q302 IC752 Q765 Q301 Q607 Q252 Q851 Q660 Q852 Q251 Q608 IC351 IC301 IC451 Q659 Q658 Q657
VR302 VR301
IC751
PD4077
IC351
TREBLE
BASS
MAIN AMP UNIT (CWH1020)
IC, Q
Q601
Q602 Q603 Q604
Q460 Q458 Q661 Q459 Q457 Q662
IC551 IC552
RL601 RELAY
14.3V
8.8V
7.6V
S551 LOUDNESS SWITCH
TUNER POWER SWITCH
VOLUME
BALANCE
FADER
DIN CONNECTOR TO POWER AMP
14.3V
SWD +B
L ch
R ch
GND
L-CH ⊖
L-CH ⊕
GND
R-CH ⊕
R-CH ⊖
14.3V
AUTO ANTENNA +B
FUSE, 4A
ACC +B 14.3V
FUSE, 4A
BACK UP +B 14.3V
FUSE, 1A
ILLUMI +B 14.3V
PROTECTIVE CIRCUIT UNIT (CWM1191)
Q Q1 Q2 Q3 Q4 Q5
CONNECTOR
TO REMOTE TUNING CONTROLLER
SWITCH UNIT (CWS1026)
IC, Q IC901 Q901 Q910 Q904 Q903 Q905 Q906 Q907 Q902 Q909
EJECT
MEMO
AUTO
P.SCAN
SEEK
LOC.S
MONO
T.SCAN
B.SKIP
DOLBY NR
REPEAT
RESET
BAND
DIR/REL
UP/FF
DOWN/REW
5V
2.5V
0V

IC351 : TA75558S IC451 : NJM4558S IC501 : µPB553AC IC701 : PA3019 IC751 : PD4077C IC752 : MN1280-L

, 608, 652, 655, 702, 703, 705, 751,758, 760, 762 : 2SC1740S or 2SC2458 Q204～208, 606 : 2SC2458

51, 654, 656, 753, 755, 851, 852 : 2SA1048 Q504, 754, 756, 759, 764, 766～768 : UN4212 or DTC124ES

1 or DTA114ES Q752 : 2SA1150 Q761, 763, 765 : UN4113 or DTA144ES

, 753, 754 : US1040M, 1SS176 or 1SS133 D203, 204 : 1S1555 D205 : KV1235Z3 or KV1235Z5 D501 : HZS2R7EB1, B2 or RD2R7ESB1, B2

, B2 or HZS5R1EB1, B2 D653 : HZS8R2JB2, B3 or RD8R2JSB2, B3 D701 : HZS7R5JB1 or RD7R5JSB1 D751 : HZS8R2JB1 or RD8R2JSB1

IC551, 552 : TA7270P Q457～460, 601, 603～605 : 2SC2458 or 2SC536SP Q602 : 2SB941
Q661, 662 : 2SD1468S or 2SD1012
D601, 605 : ERA15-02VH or SM-1A-02LFD D602, 604 : US1040M, 1SS133 or 1SS176 D603 : RD6R2ESB2 or HZS6R2EB2

TUNER UNIT IC201

1	2	3	4	5	6	7	8	9	10
5.0V	2.1V	0.6V	0V	0V	2.1V	8.6V	8.6V	0.9V	8.6V
11	12	13	14	15	16	17	18	19	20
0.7V	0V	2.3V	8.6V	1.3V	0.4V	2.3V	5.7V	5.7V	3.0V

TUNER UNIT IC451

1	2	3	4	5	6	7	8	9
8.8V	4.8V	4.8V	4.8V	0V	4.8V	4.8V	4.8V	

Q1 : 2SB1066MF Q2 : 2SA1048 or 2SA608SP Q3, 4 : 2SC2021F
Q5 : 2SC1740S or 2SC2458
D1, 2, 4 : US1040M 1SS133 or 1SS176 D3 : RD22JSB2 or HZS22

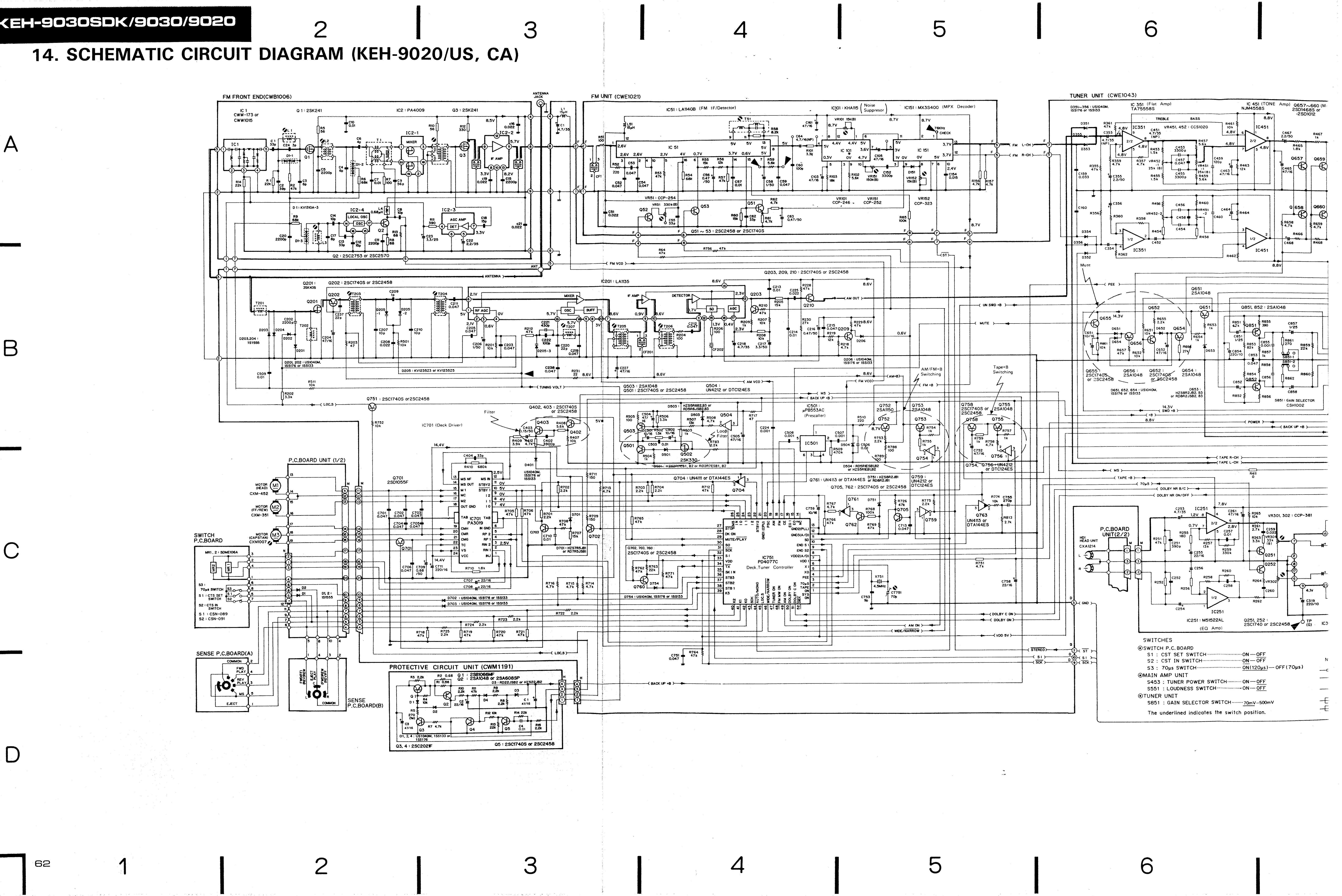
IC901 : PD4078C Q901 : 2SD601-YQ or 2SC2712-LG Q902～907 : UN2216 or DTC143TK Q909, 910 : 2SB709-AQ or 2SA1179-M4
D901～903 : MA151K D911～916 : SLR-320MT3

3
V
6
V

FM UNIT IC151

1	2	3	4	5	6	7
	8.7V	1V		3V	5V	0V
8	9	10	11	12	13	
0V	0V	2.4V	5V	3.7V	3.7V	

14. SCHEMATIC CIRCUIT DIAGRAM (KEH-9020/US, CA)


2
3
4
5
6
A
B
C
D
1
FM FRONT END(CWB1006)
IC1 CWW-173 or CWW1015
Q1 : 2SK241
IC2 : PA4009
Q3 : 2SK241
IC2-1 MIXER
IC2-2 IF AMP
IC2-4 LOCAL OSC
IC2-3 AGC AMP DET
D1 : KV1310A-3
Q2 : 2SC2753 or 2SC2570
ANTENNA JACK
ANTENNA
ANT
FM UNIT (CWE1021)
IC51 : LA1140B (FM IF/Detector)
IC101 : KHA115 (Noise Suppresor)
IC151 : MX3S400 (MPX Decoder)
IC 51
IC 101
IC 151
VR51 : CCP-254
VR101 : CCP-246
VR151 : CCP-252
VR152 : CCP-323
Q51 ~ 53 : 2SC2458 or 2SC1740S
76KHz CHECK
FM L-CH
FM R-CH
FM VCO
TUNER UNIT (CWE1043)
D351~356 : US1040M, 1SS176 or 1SS133
IC 351 (Flat Amp) TA75558S
IC 451 (TONE Amp) NJM4558S
Q657~660 (M... 2SD1468S or 2SD1012
VR451, 452 : CCS1020
TREBLE
BASS
IC351
IC451
Mute
PEE
Q651 2SA1048
Q652
Q655
Q656
Q654
Q851, 852 : 2SA1048
Q655 : 2SC1740S or 2SC2458
Q656 : 2SA1048
Q652 : 2SC1740S or 2SC2458
Q654 : 2SA1048
D651, 652, 654 : US1040M, 1SS176 or 1SS133
D653 : HZS8R2JB2, B3 or RD8R2JS2B2, B3
S851 : GAIN SELECTOR CSH1002
Q201 : 2SK435
Q202 : 2SC1740S or 2SC2458
IC201 : LA1135
Q203, 209, 210 : 2SC1740S or 2SC2458
RF AGC
MIXER
OSC
BUFF
IF AMP
DETECTOR
SD
AGC
AM OUT
UN SWD +B
MUTE
D203, 204 : 1S1555
D201, 202 : US1040M, 1SS176 or 1SS133
D205 : KV1235Z3 or KV1235Z5
D206 : US1040M, 1SS176 or 1SS133
TUNING VOLT
AM VCO
LOC.S
Q751 : 2SC1740S or 2SC2458
Q503 : 2SA1048
Q501 : 2SC1740S or 2SC2458
Q504 : UN4212 or DTC124ES
D503 : HZS5R6B2, B3 or RD5R6JS2B2, B3
Q502 2SK330
Loop Filter
IC501 : μPB553AC (Prescaller)
IC501
D501 : HZ2R7EB1, B2 or RD2R7ES81, B2
D504 : RD5R1ESB1B2 or HZS5R1EB1B2
Q752 2SA1150
Q753 2SA1048
Q754
AM/FM+B Switching
Tape+B Switching
Q758 2SC1740S or 2SC2458
Q755 2SA1048
Q756
Q754, Q756 : UN4212 or DTC124ES
FM VCO
AM+B
MS
BACK UP +B
FM +B
POWER
BACK UP +B
TAPE R-CH
TAPE L-CH
Filter
Q402, 403 : 2SC1740S or 2SC2458
IC701 (Deck Driver)
Q701 2SD1055F
IC701 PA3019
D401 : US1040M, 1SS176 or 1SS133
D701 : HZS7R5JB1 or RD7R5JS81
Q704 : UN4111 or DTA144ES
Q761 : UN4113 or DTA144ES
D751 : HZS8R2JB1 or RD8R2JB1
Q705, 762 : 2SC1740S or 2SC2458
Q759 : UN4212 or DTC124ES
Q763 UN4113 or DTA144ES
Q702, 703, 760 2SC1740S or 2SC2458
IC751 PD4077C Deck.Tuner Controller
D702 : US1040M, 1SS176 or 1SS133
D703 : US1040M, 1SS176 or 1SS133
D754 : US1040M, 1SS176 or 1SS133
X751 4.5MHz
P.C.BOARD UNIT (1/2)
MOTOR (HEAD) CXM-452
MOTOR (FF/REW) CXM-351
MOTOR (CAPSTAN) CXM1007
SWITCH P.C.BOARD
MR1, 2 : SDME106A
S3 : 70μs SWITCH
S1 : CTS SET SWITCH
S2 : CTS IN SWITCH
S1 : CSN-089
S2 : CSN-091
DL 2 : 1S1555
SENSE P.C.BOARD(A)
COMMON
FWD PLAY
REV PLAY
MS
EJECT
SENSE P.C.BOARD(B)
PROTECTIVE CIRCUIT UNIT (CWM1191)
Q1 : 2SB1066MF
Q2 : 2SA1048 or 2SA608SP
D3 : RD22JSB2 or HZS22JB2
D1, 2, 4 : US1040M, 1SS133 or 1SS176
Q3, 4 : 2SC2021F
Q5 : 2SC1740S or 2SC2458
BACK UP +B
LOC.S
STEREO
ST
SI
SCK
GND
DOLBY C ON
DOLBY ON
VDD 5V
AM ON
WIDE/NARROW
MS
TAPE +B
70μs
DOLBY NR B/C
DOLBY NR ON/OFF
P.C.BOARD UNIT(2/2)
HD1 HEAD UNIT CXA1214
IC251
IC251 : M51522AL (EQ Amp)
Q251, 252 : 2SC1740 or 2SC2458
VR301, 302 : CCP-381
TP (G)

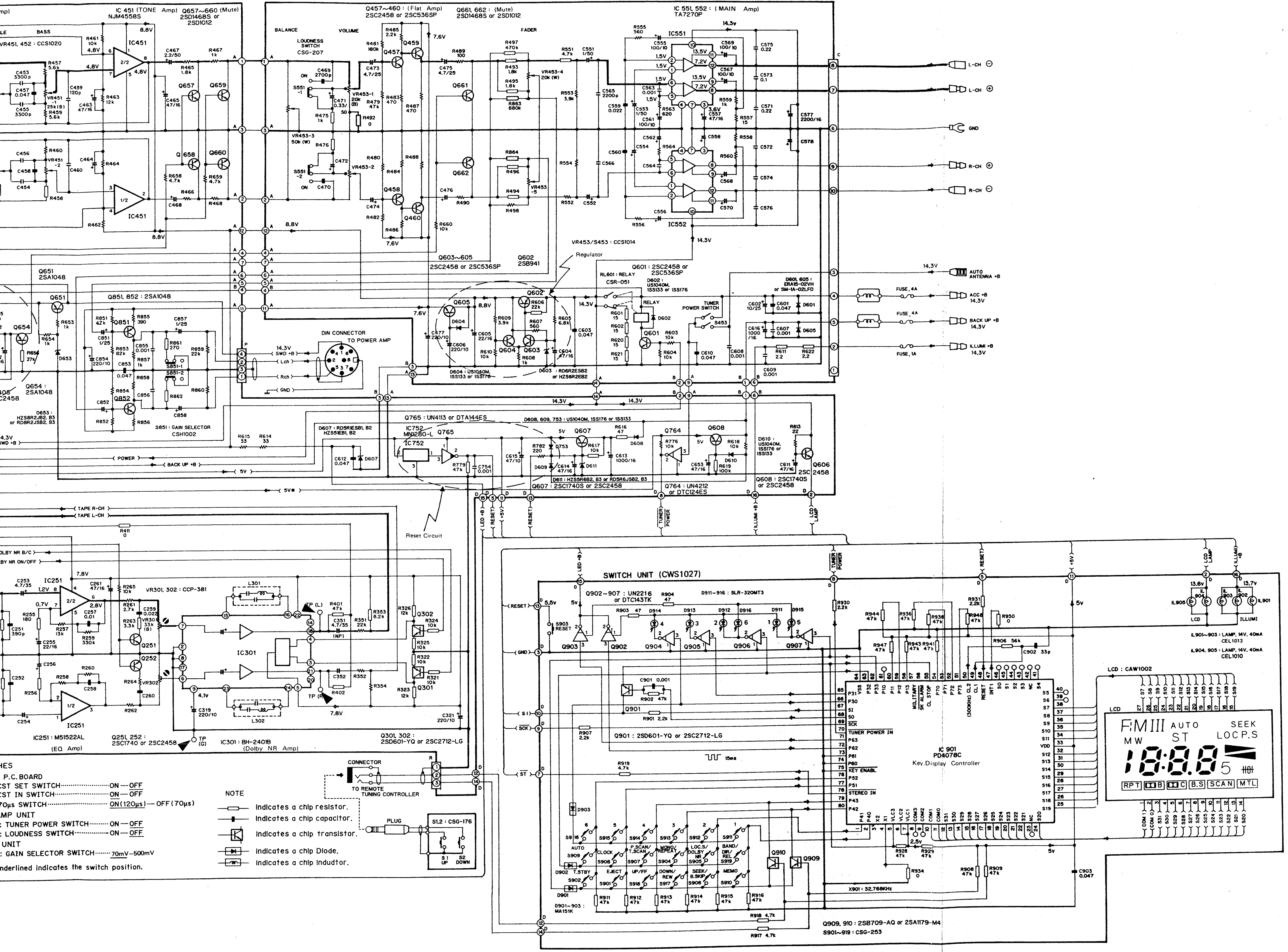
SWITCHES

⊙SWITCH P.C.BOARD
S1 : CST SET SWITCH··········ON—OFF
S2 : CST IN SWITCH··········ON—OFF
S3 : 70μs SWITCH··········ON(120μs)—OFF(70μs)

⊙MAIN AMP UNIT
S453 : TUNER POWER SWITCH··········ON—OFF
S551 : LOUDNESS SWITCH··········ON—OFF

⊙TUNER UNIT
S851 : GAIN SELECTOR SWITCH··········70mV–500mV

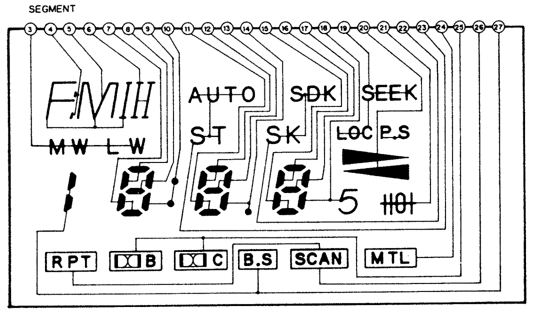
The underlined indicates the switch position.

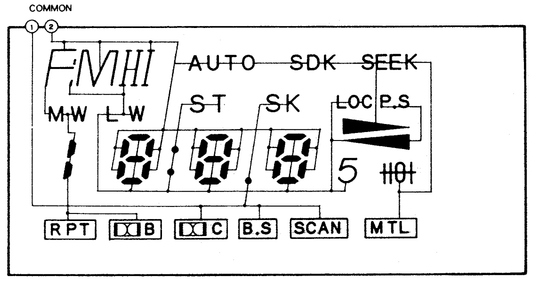

MAIN AMP UNIT (CWH1023)
IC 451 (TONE Amp) NJM4558S
Q657~660 (Mute) 2SD1468S or 2SD1012
VR451, 452 : CCS1020
Q457~460 : (Flat Amp) 2SC2458 or 2SC536SP
Q661, 662 : (Mute) 2SD1468S or 2SD1012
IC 551, 552 : (MAIN Amp) TA7270P
BALANCE
LOUDNESS SWITCH CSG-207
VOLUME
FADER
VR453/S453 : CCS1014
Q603~605 2SC2458 or 2SC536SP
Q602 2SB941
Regulator
RL601 : RELAY CSR-051
Q601 : 2SC2458 or 2SC536SP
Q602 : US1040M, 1SS133 or 1SS176
D601, 605 : ERA15-02VH or SM-1A-02LFD
TUNER POWER SWITCH
L-CH ⊖
L-CH ⊕
GND
R-CH ⊕
R-CH ⊖
AUTO ANTENNA +B 14.3V
FUSE, 4A
ACC +B 14.3V
BACK UP +B 14.3V
FUSE, 1A
ILLUMI +B 14.3V
Q651 2SA1048
Q851, 852 : 2SA1048
Q654 : 2SA1048
D653 : HZS8R2, B2, B3 or RD8R2JSB2, B3
S851 : GAIN SELECTOR CSH1002
DIN CONNECTOR TO POWER AMP
D604 : US1040M, 1SS133 or 1SS176
D603 : RD6R2ESB2 or HZS6R2EB2
Q765 : UN4113 or DTA144ES
D608, 609, 753 : US1040M, 1SS176 or 1SS133
IC752 MN1280-L
D607 : RD5R1ESB1, B2 HZS5IEB1, B2
D611 : HZS5R6B2, B3 or RD5R6JSB2, B3
Q607 : 2SC1740S or 2SC2458
Q764 : UN4212 or DTC124ES
Q608 : 2SC1740S or 2SC2458
D610 : US1040M, 1SS176 or 1SS133
Reset Circuit
POWER
BACK UP +B
5V
5V
TAPE R-CH
TAPE L-CH
DOLBY NR B/C
DOLBY NR ON/OFF
IC251
VR301, 302 : CCP-381
L301
L302
IC301
TP (L)
TP (R)
TP (G)
IC251 : M51522AL (EQ Amp)
Q251, 252 : 2SC1740 or 2SC2458
IC301 : BH-2401B (Dolby NR Amp)
Q301, 302 : 2SD601-YQ or 2SC2712-LG
CONNECTOR
TO REMOTE TUNING CONTROLLER
PLUG
S1,2 : CSG-176
S1 UP
S2 DOWN
SWITCH UNIT (CWS1027)
Q902~907 : UN2216 or DTC143TK
D911~916 : SLR-320MT3
RESET
GND
SI
SCK
ST
LED +B
TUNER POWER
ILLUMI +B
LCD LAMP
IL901~903 : LAMP, 14V, 40mA CEL1013
IL904, 905 : LAMP, 14V, 40mA CEL1010
LCD : CAW1002
IC 901 PD4078C Key.Display Controller
Q901 : 2SD601-YQ or 2SC2712-LG
15ms
AUTO
CLOCK
EJECT
T.STBY
UP/FF
P.SCAN/ I.SCAN
DOWN/ REW
MONO/ REPEAT
LOC.S/ DOLBY NR
SEEK/ B.SKIP
BAND/ DEL/ REL
MEMO
X901 : 32.768KHz
D901~903 : MA151K
Q909, 910 : 2SB709-AQ or 2SA1179-M4
S901~919 : CSG-253
FM III AUTO SEEK ST LOC P.S MW 18.8.8 5 RPT B C B.S SCAN MTL

HES
P.C. BOARD
CST SET SWITCH··························ON — OFF
CST IN SWITCH·························ON — OFF
70µs SWITCH··························ON(120µs) — OFF(70µs)
AMP UNIT
: TUNER POWER SWITCH·········ON — OFF
: LOUDNESS SWITCH··············ON — OFF
UNIT
: GAIN SELECTOR SWITCH·········70mV–500mV
nderlined indicates the switch position.

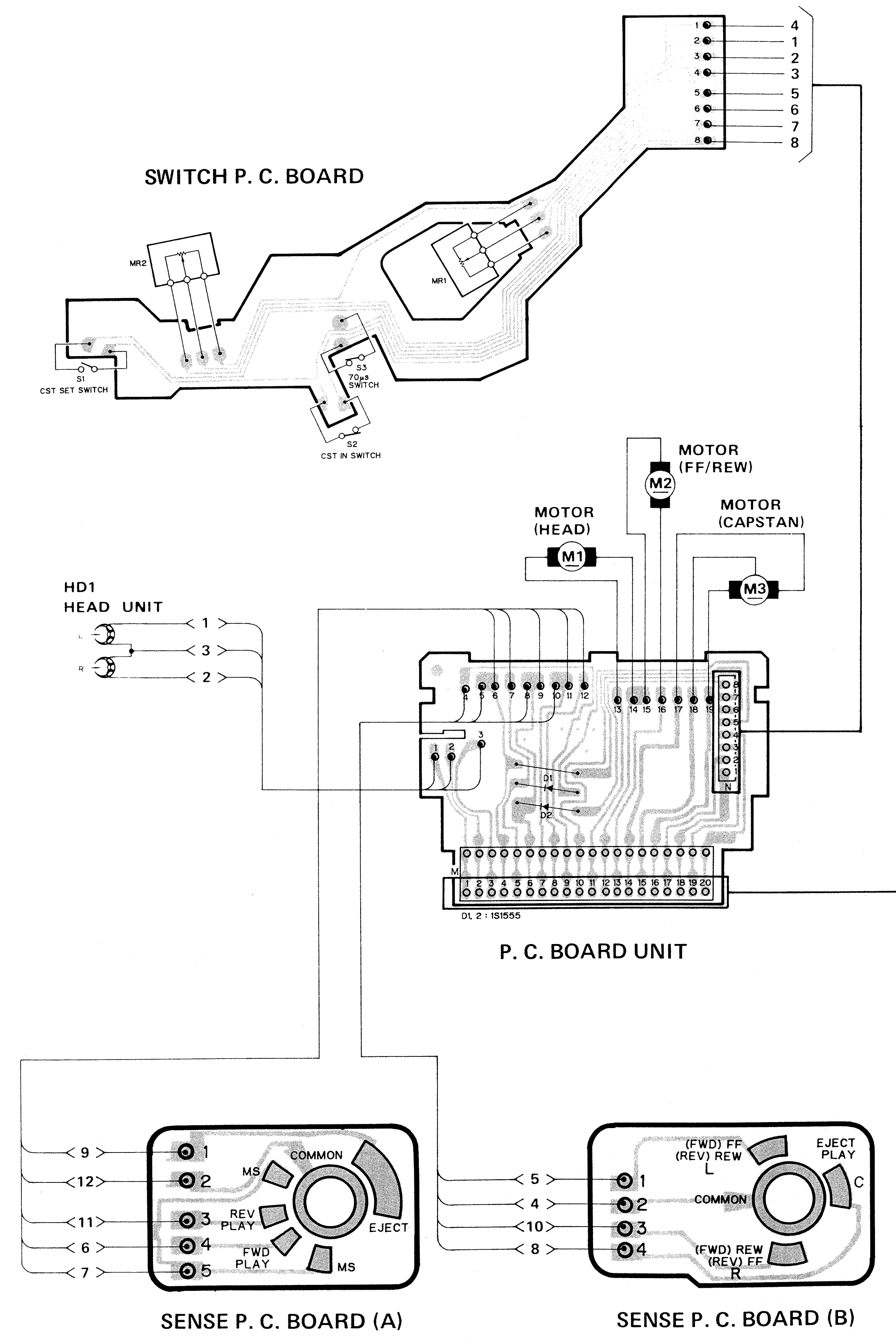
NOTE

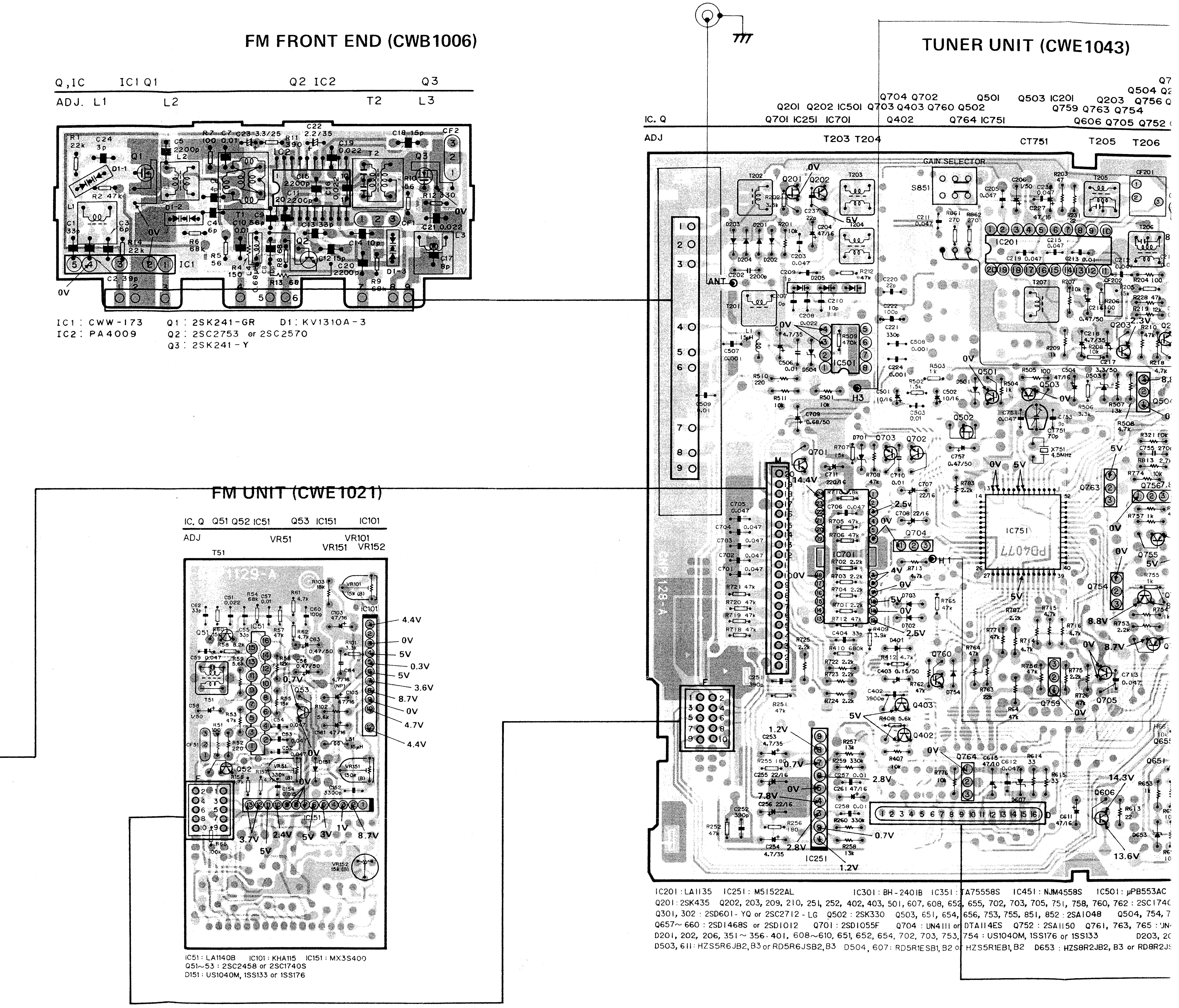
Indicates a chip resistor.
Indicates a chip capacitor.
Indicates a chip transistor.
Indicates a chip Diode.
Indicates a chip Indudtor.


SEGMENT
FMIII AUTO SDK SEEK
MW LW ST SK LOC P.S
18.8.8 5
RPT B C B.S SCAN MTL


COMMON
FMIII AUTO SDK SEEK
MW LW ST SK LOC P.S
18.8.8 5
RPT B C B.S SCAN MTL

15. CONNECTION DIAGRAM (KEH-9020/US, CA)


SWITCH P. C. BOARD
MR1
MR2
S1 CST SET SWITCH
S3 70μs SWITCH
S2 CST IN SWITCH
MOTOR (FF/REW)
M2
MOTOR (HEAD)
M1
MOTOR (CAPSTAN)
M3
HD1 HEAD UNIT
L
R
D1
D2
DL 2 : 1S1555
P. C. BOARD UNIT
COMMON
MS
REV PLAY
FWD PLAY
EJECT
SENSE P. C. BOARD (A)
(FWD) FF (REV) REW
L
EJECT PLAY
C
COMMON
(FWD) REW (REV) FF
R
SENSE P. C. BOARD (B)


FM FRONT END (CWB1006)
ANTENNA JACK
TUNER UNIT (CWE1043)
FM UNIT (CWE1021)
IC751
GAIN SELECTOR
ANT

IC1 : CWW-173
IC2 : PA4009
Q1 : 2SK241-GR
Q2 : 2SC2753 or 2SC2570
Q3 : 2SK241-Y
D1 : KV1310A-3

IC51 : LA1140B IC101 : KHA115 IC151 : MX3S400
Q51~53 : 2SC2458 or 2SC1740S
D151 : US1040M, 1SS133 or 1SS176

IC201 : LA1135 IC251 : M51522AL IC301 : BH-2401B IC351 : TA75558S IC451 : NJM4558S IC501 : μPB553AC
Q201 : 2SK435 Q202, 203, 209, 210, 251, 252, 402, 403, 501, 607, 608, 652, 655, 702, 703, 705, 751, 758, 760, 762 : 2SC174
Q301, 302 : 2SD601-YQ or 2SC2712-LG Q502 : 2SK330 Q503, 651, 654, 656, 753, 755, 851, 852 : 2SA1048 Q504, 754, 7
Q657~660 : 2SD1468S or 2SD1012 Q701 : 2SD1055F Q704 : UN4111 or DTA114ES Q752 : 2SA1150 Q761, 763, 765 : UN
D201, 202, 206, 351~356, 401, 608~610, 651, 652, 654, 702, 703, 753, 754 : US1040M, 1SS176 or 1SS133 D203, 2
D503, 611 : HZS5R6JB2, B3 or RD5R6JSB2, B3 D504, 607 : RD5R1ESB1, B2 or HZS5R1EB1, B2 D653 : HZS8R2JB2, B3 or RD8R2J

FM FRONT END IC2

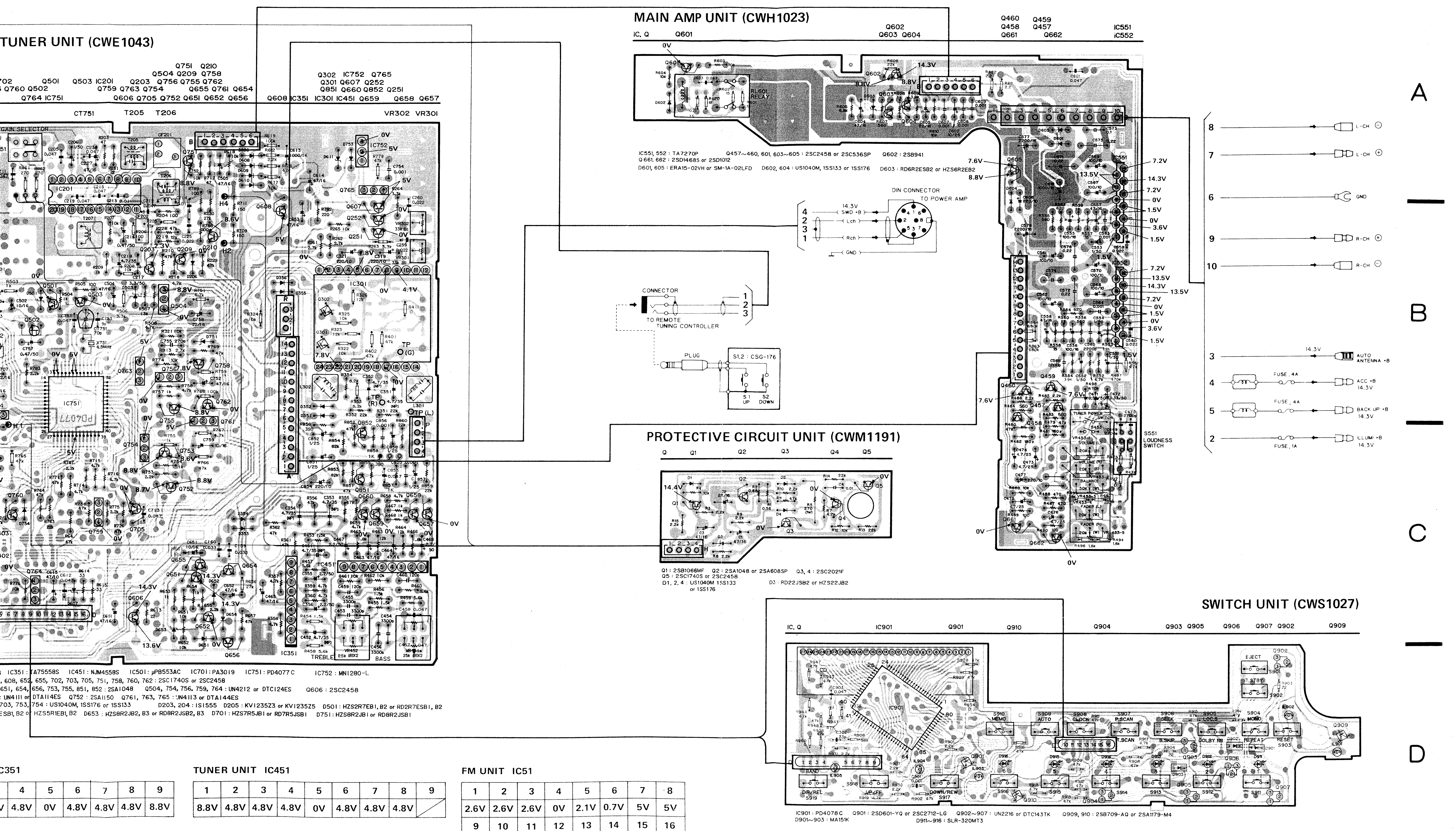
1	2	3	4	5	6	7	8	9	10
	0V				0V	3.3V	3.3V		0V
11	12	13	14	15	16	17	18	19	20
5.7V	8.5V	8.2V		0V				0V	

TUNER UNIT IC201

1	2	3	4	5	6	7	8	9	10
5V	2.1V	0.6V	0V	0V	2.1V	8.6V	8.6V	0.9V	8.6V
11	12	13	14	15	16	17	18	19	20
0.7V	0V	2.3V	8.6V	1.3V	0.4V	2.3V	5.7V	5.7V	3V

TUNER UNIT IC351

1	2	3	4	5	6	7	8	9
	4.8V	4.8V	4.8V	0V	4.8V	4.8V	4.8V	8.8V


TUNER UNIT (CWE1043)
MAIN AMP UNIT (CWH1023)
PROTECTIVE CIRCUIT UNIT (CWM1191)
SWITCH UNIT (CWS1027)
DIN CONNECTOR
TO POWER AMP
14.3V SWD +B
Lch
Rch
GND
CONNECTOR
TO REMOTE TUNING CONTROLLER
PLUG
S1,2 : CSG-176
S1 UP
S2 DOWN
L-CH ⊖
L-CH ⊕
GND
R-CH ⊕
R-CH ⊖
14.3V AUTO ANTENNA +B
FUSE, 4A ACC +B 14.3V
FUSE, 4A BACK UP +B 14.3V
FUSE, 1A ILLUMI +B 14.3V
S551 LOUDNESS SWITCH
TUNER POWER SWITCH
VOLUME
BALANCE
FADER
TREBLE
BASS
GAIN SELECTOR
RL601 RELAY
IC751 PD4077
IC901
EJECT
ST.BTBY
MEMO
AUTO
CLOCK
P.SCAN
SEEK
LOC
MONO
T.SCAN
B.SKIP
DOLBY NR
REPEAT
RESET
BAND
DIR/REL
UP/FF
DOWN/REW
A
B
C
D

IC351 : TA75558S IC451 : NJM4558S IC501 : μPB553AC IC701 : PA3019 IC751 : PD4077C IC752 : MN1280-L
608, 652, 655, 702, 703, 705, 751, 758, 760, 762 : 2SC1740S or 2SC2458
651, 654, 656, 753, 755, 851, 852 : 2SA1048 Q504, 754, 756, 759, 764 : UN4212 or DTC124ES Q606 : 2SC2458
UN4111 or DTA114ES Q752 : 2SA1150 Q761, 763, 765 : UN4113 or DTA144ES
703, 753, 754 : US1040M, 1SS176 or 1SS133 D203, 204 : 1S1555 D205 : KV1235Z3 or KV1235Z5 D501 : HZS2R7EB1, B2 or RD2R7ESB1, B2
ESB1, B2 or HZS5R1EB1, B2 D653 : HZS8R2JB2, B3 or RD8R2JSB2, B3 D701 : HZS7R5JB1 or RD7R5JSB1 D751 : HZS8R2JB1 or RD8R2JSB1

IC551, 552 : TA7270P Q457~460, 601, 603~605 : 2SC2458 or 2SC536SP Q602 : 2SB941
Q661, 662 : 2SD1468S or 2SD1012
D601, 605 : ERA15-02VH or SM-1A-02LFD D602, 604 : US1040M, 1SS133 or 1SS176 D603 : RD6R2ESB2 or HZS6R2EB2

Q1 : 2SB1066MF Q2 : 2SA1048 or 2SA608SP Q3, 4 : 2SC2021F
Q5 : 2SC1740S or 2SC2458
D1, 2, 4 : US1040M 1SS133 or 1SS176 D3 : RD22JSB2 or HZS22JB2

IC901 : PD4078C Q901 : 2SD601-YQ or 2SC2712-LG Q902~907 : UN2216 or DTC143TK Q909, 910 : 2SB709-AQ or 2SA1179-M4
D901~903 : MA151K D911~916 : SLR-320MT3

C351

4	5	6	7	8	9
4.8V	0V	4.8V	4.8V	4.8V	8.8V

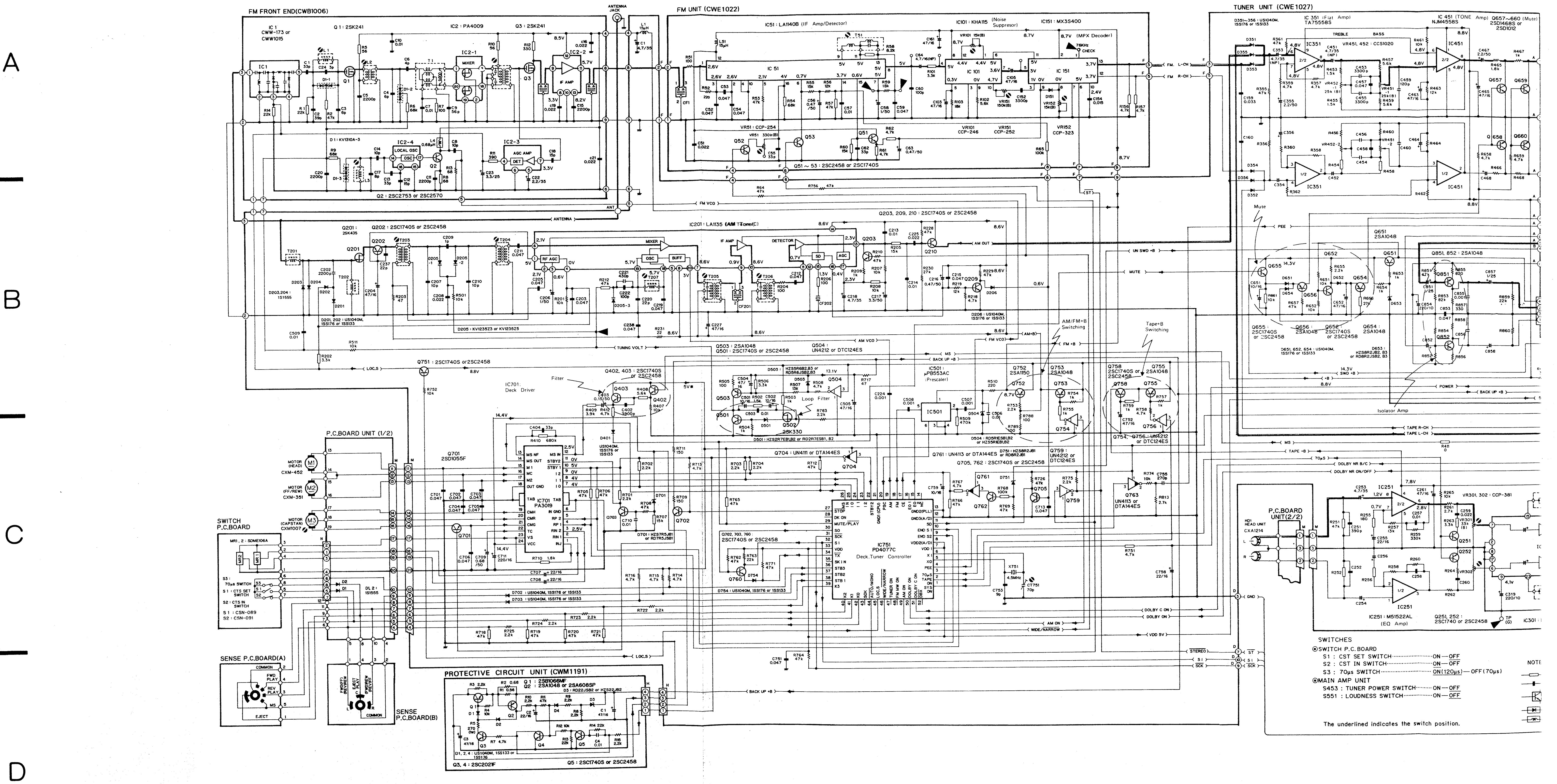
TUNER UNIT IC451

1	2	3	4	5	6	7	8	9
8.8V	4.8V	4.8V	4.8V	0V	4.8V	4.8V	4.8V	

FM UNIT IC51

1	2	3	4	5	6	7	8
2.6V	2.6V	2.6V	0V	2.1V	0.7V	5V	5V
9	10	11	12	13	14	15	16
5V	0V	5V		5V	3.7V	0.6V	4V

16. SCHEMATIC CIRCUIT DIAGRAM (KEH-9020/G)


A
B
C
D
FM FRONT END (CWB1006)
ANTENNA JACK
FM UNIT (CWE1022)
TUNER UNIT (CWE1027)
IC51 : LA1140B (IF Amp/Detector)
IC101 : KHA115 (Noise Suppresor)
IC151 : MX3S400
IC201 : LA1135 (AM Tuner)
IC 351 (Flat Amp) TA75558S
IC 451 (TONE Amp) NJM4558S
IC501 : μPB553AC (Prescaler)
IC701 : Deck Driver
IC751 PD4077C Deck·Tuner Controller
IC251 : M51522AL (EQ Amp)
P.C.BOARD UNIT (1/2)
P.C.BOARD UNIT (2/2)
SWITCH P.C.BOARD
SENSE P.C.BOARD(A)
SENSE P.C.BOARD(B)
PROTECTIVE CIRCUIT UNIT (CWM1191)
MOTOR (HEAD) CXM-452
MOTOR (FF/REW) CXM-351
MOTOR (CAPSTAN) CXM1007
HD1 HEAD UNIT CXA1214
Isolator Amp
AM/FM+B Switching
Tape+B Switching
Mute
Loop Filter
Filter

SWITCHES

◎SWITCH P.C. BOARD

S1 : CST SET SWITCH ....ON—OFF

S2 : CST IN SWITCH............ON—OFF

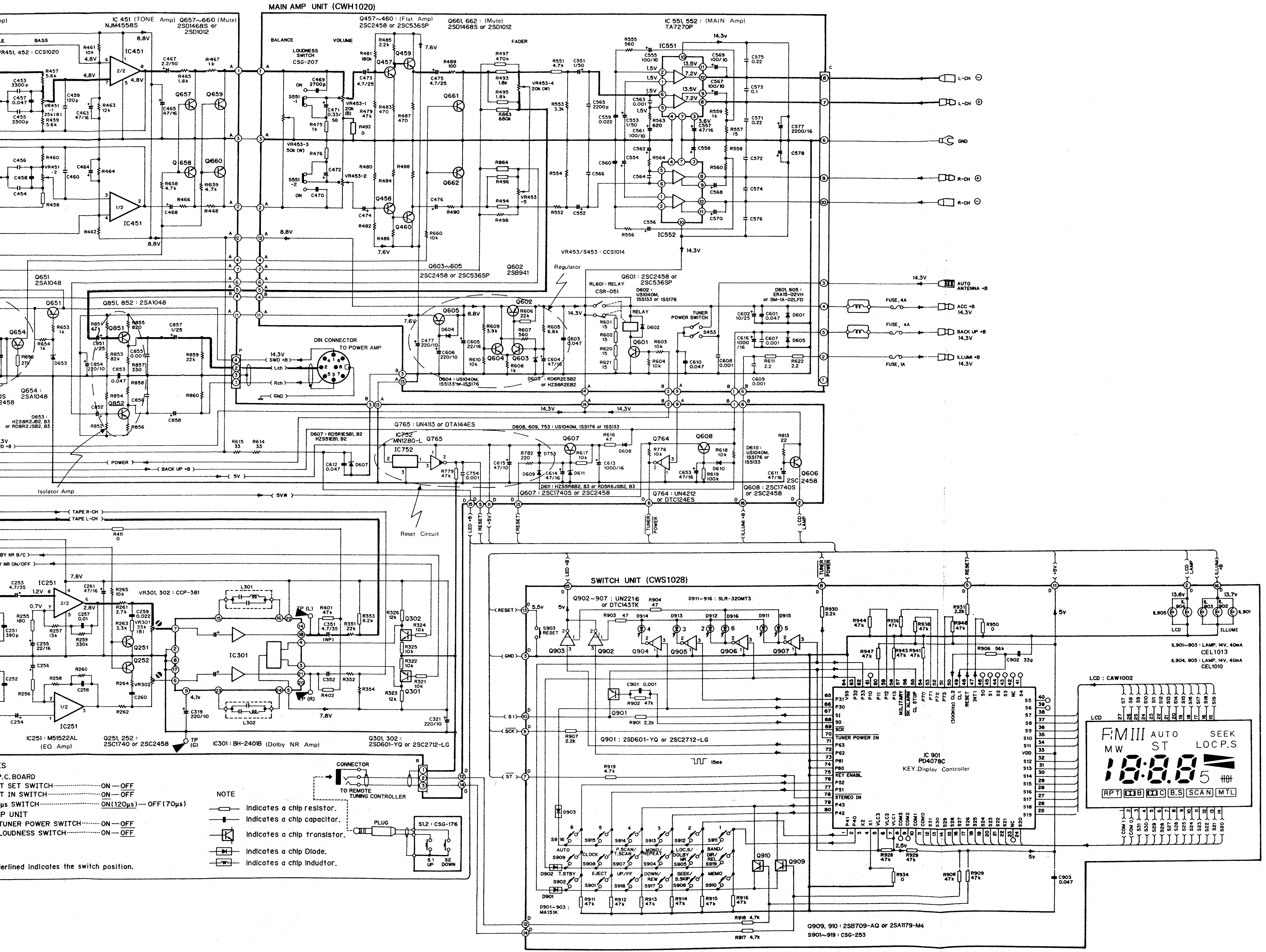
S3 : 70μs SWITCH............ON(120μs)—OFF(70μs)

◎MAIN AMP UNIT

S453 : TUNER POWER SWITCH............ON—OFF

S551 : LOUDNESS SWITCH............ON—OFF

The underlined indicates the switch position.

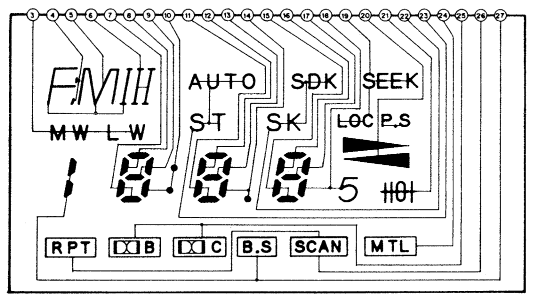

7
8
9
10
11
12
MAIN AMP UNIT (CWH1020)
IC 451 (TONE Amp) NJM4558S
Q657~660 (Mute) 2SD1468S or 2SD1012
VR451, 452 : CCS1020
BASS
BALANCE
LOUDNESS SWITCH CSG-207
VOLUME
FADER
Q457~460 : (Flat Amp) 2SC2458 or 2SC536SP
Q661, 662 : (Mute) 2SD1468S or 2SD1012
IC 551, 552 : (MAIN Amp) TA7270P
IC551
IC552
IC451
VR453/S453 : CCS1014
Q603~605 2SC2458 or 2SC536SP
Q602 2SB941
Regulator
RL601 : RELAY CSR-051
Q601 : 2SC2458 or 2SC536SP
D602 : US1040M, 1SS133 or 1SS176
D601, 605 : ERA15-02VH or SM-1A-02LFD
TUNER POWER SWITCH
RELAY
D604 : US1040M, 1SS133 or 1SS176
D603 : RD6R2ESB2 or HZS6R2EB2
L-CH ⊖
L-CH ⊕
GND
R-CH ⊕
R-CH ⊖
AUTO ANTENNA +B
FUSE, 4A
ACC +B 14.3V
BACK UP +B 14.3V
FUSE, 1A
ILLUMI +B 14.3V
Q651 2SA1048
Q851, 852 : 2SA1048
Q654 : 2SA1048
D653 : HZS8R2JB2, B3 or RD8R2JSB2, B3
DIN CONNECTOR TO POWER AMP
SWD +B
Lch
Rch
GND
POWER
BACK UP +B
5V
5V※
Isolator Amp
Q765 : UN4113 or DTA144ES
D607 : RD5R1ESB1, B2 HZS51EB1, B2
IC752 MN1280-L
D608, 609, 753 : US1040M, 1SS176 or 1SS133
D611 : HZS5R6B2, B3 or RD5R6JSB2, B3
Q607 : 2SC1740S or 2SC2458
Q764 : UN4212 or DTC124ES
D610 : US1040M, 1SS176 or 1SS133
Q608 : 2SC1740S or 2SC2458
Q606 2SC2458
Reset Circuit
LED +B
RESET
+5V
TUNER POWER
ILLUMI +B
LCD LAMP
TAPE R-CH
TAPE L-CH
DOLBY NR B/C
DOLBY NR ON/OFF
IC251
VR301, 302 : CCP-381
IC301
TP (L)
TP (R)
TP (G)
L301
L302
IC251 : M51522AL (EQ Amp)
Q251, 252 : 2SC1740 or 2SC2458
IC301 : BH-2401B (Dolby NR Amp)
Q301, 302 : 2SD601-YQ or 2SC2712-LG
CONNECTOR
TO REMOTE TUNING CONTROLLER
PLUG
S1,2 : CSG-176
S1 UP
S2 DOWN
SWITCH UNIT (CWS1028)
Q902~907 : UN2216 or DTC143TK
D911~916 : SLR-320MT3
S903 RESET
GND
SI
SCK
ST
Q901 : 2SD601-YQ or 2SC2712-LG
15ms
IC 901 PD4078C KEY.Display Controller
TUNER POWER IN
KEY ENABL
STEREO IN
MILITARY
SK ALARM
CL STOP
(300KHz)
IL901~903 : LAMP, 14V, 40mA CEL1013
IL904, 905 : LAMP, 14V, 40mA CEL1010
LCD
ILLUMI
LCD : CAW1002
AUTO
CLOCK
P.SCAN/T.SCAN
MONO/REPEAT
LOC.S/DOLBY NR
BAND/DIR/REL
T.STBY
EJECT
UP/FF
DOWN/REW
SEEK/B.SKIP
MEMO
D901~903 : MA151K
Q909, 910 : 2SB709-AQ or 2SA1179-M4
S901~919 : CSG-253
FMIII AUTO SEEK MW ST LOC P.S
RPT B C B.S SCAN MTL

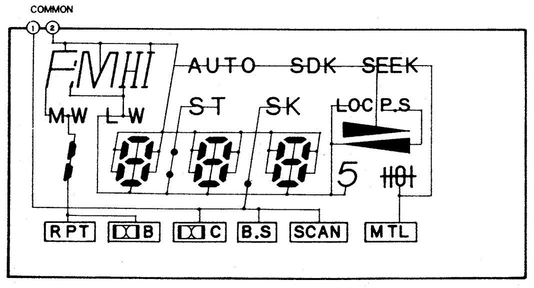
ES
P.C.BOARD
T SET SWITCH··········ON—OFF
T IN SWITCH··········ON—OFF
µs SWITCH··········ON(120µs)—OFF(70µs)
P UNIT
TUNER POWER SWITCH··········ON—OFF
LOUDNESS SWITCH··········ON—OFF

erlined indicates the switch position.

NOTE

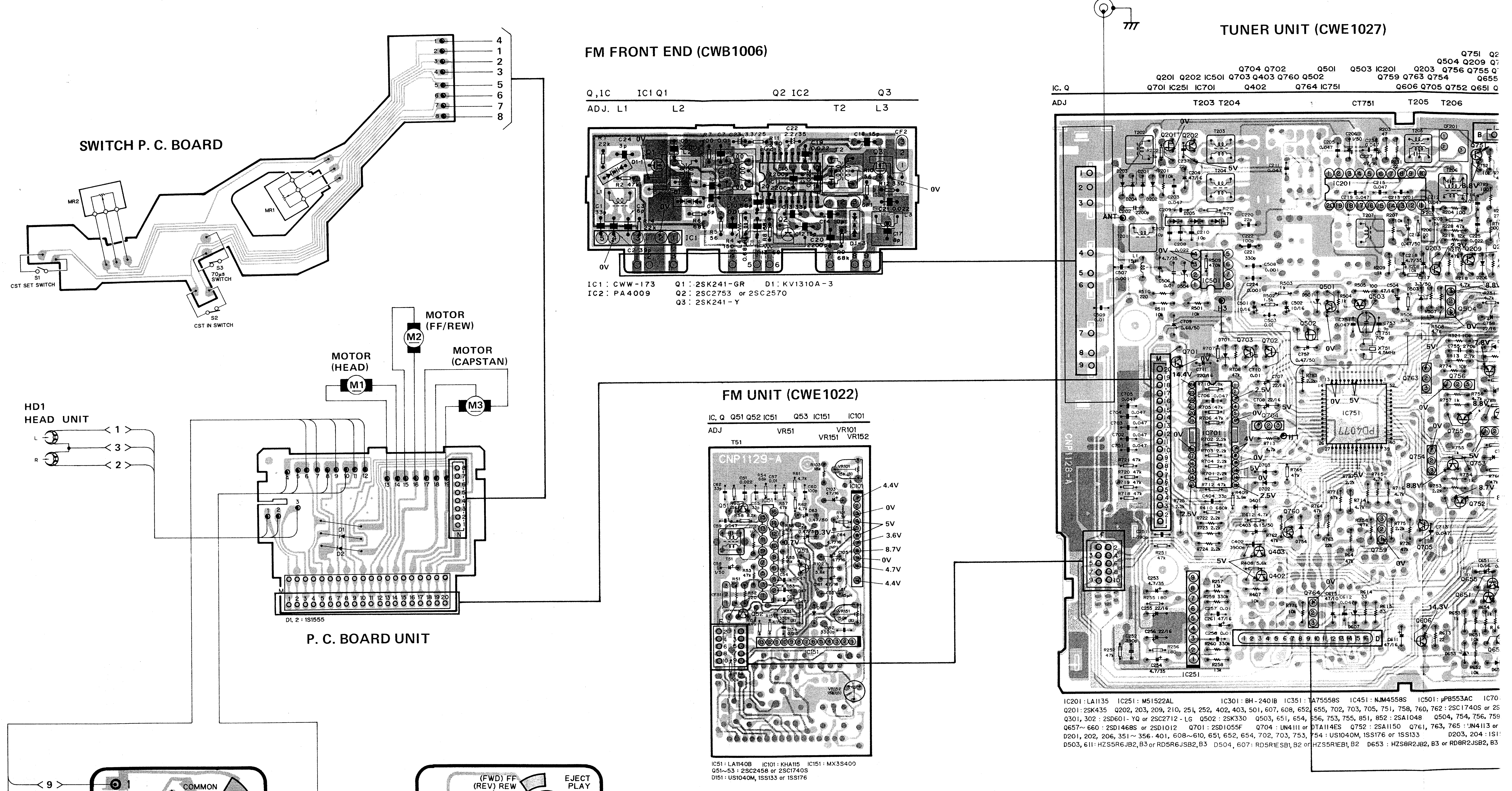
Indicates a chip resistor.
Indicates a chip capacitor.
Indicates a chip transistor.
Indicates a chip Diode.
Indicates a chip indudtor.


SEGMENT
FMIII
MW LW
AUTO
ST
SDK
SK
SEEK
LOC P.S
5
RPT
B
C
B.S
SCAN
MTL


COMMON
FMIII
MW LW
AUTO
ST
SDK
SK
SEEK
LOC P.S
5
RPT
B
C
B.S
SCAN
MTL

A
B
C
D

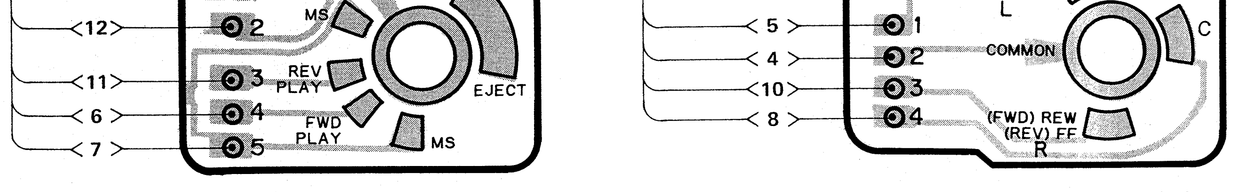
17. CONNECTION DIAGRAM (KEH-9020/G)


ANTENNA JACK
TUNER UNIT (CWE1027)
FM FRONT END (CWB1006)
Q, IC IC1 Q1 Q2 IC2 Q3
ADJ. L1 L2 T2 L3
SWITCH P. C. BOARD
MR1
MR2
S1 CST SET SWITCH
S2 CST IN SWITCH
S3 70μs SWITCH
MOTOR (FF/REW) M2
MOTOR (HEAD) M1
MOTOR (CAPSTAN) M3
HD1 HEAD UNIT
L
R
P. C. BOARD UNIT
DL 2 : 1S1555
FM UNIT (CWE1022)
IC, Q Q51 Q52 IC51 Q53 IC151 IC101
ADJ T51 VR51 VR151 VR101 VR152
CNP1129-A
CNP1128-A
4.4V
0V
5V
3.6V
8.7V
0V
4.7V
4.4V
IC. Q Q201 Q202 IC501 Q701 IC251 IC701 Q704 Q702 Q703 Q403 Q760 Q502 Q402 Q764 IC751 Q501 Q503 IC201 Q203 Q759 Q763 Q754 Q504 Q209 Q756 Q755 Q606 Q705 Q752 Q651 Q751 Q655
ADJ T203 T204 CT751 T205 T206
IC751 PD4077

IC1 : CWW-173 Q1 : 2SK241-GR D1 : KV1310A-3
IC2 : PA4009 Q2 : 2SC2753 or 2SC2570
Q3 : 2SK241-Y

IC51 : LA1140B IC101 : KHA115 IC151 : MX3S400
Q51~53 : 2SC2458 or 2SC1740S
D151 : US1040M, 1SS133 or 1SS176

IC201 : LA1135 IC251 : M51522AL IC301 : BH-2401B IC351 : TA75558S IC451 : NJM4558S IC501 : μPB553AC IC70
Q201 : 2SK435 Q202, 203, 209, 210, 251, 252, 402, 403, 501, 607, 608, 652, 655, 702, 703, 705, 751, 758, 760, 762 : 2SC1740S or 2S
Q301, 302 : 2SD601-YQ or 2SC2712-LG Q502 : 2SK330 Q503, 651, 654, 656, 753, 755, 851, 852 : 2SA1048 Q504, 754, 756, 759
Q657~660 : 2SD1468S or 2SD1012 Q701 : 2SD1055F Q704 : UN4111 or DTA114ES Q752 : 2SA1150 Q761, 763, 765 : UN4113 or
D201, 202, 206, 351~356・401, 608~610, 651, 652, 654, 702, 703, 753, 754 : US1040M, 1SS176 or 1SS133 D203, 204 : 1S
D503, 611 : HZS5R6JB2, B3 or RD5R6JSB2, B3 D504, 607 : RD5R1ESB1, B2 or HZS5R1EB1, B2 D653 : HZS8R2JB2, B3 or RD8R2JSB2, B3


9
12
11
6
7
1
2
3
4
5
MS
COMMON
REV PLAY
FWD PLAY
EJECT
MS
5
4
10
8
(FWD) FF
(REV) REW
L
COMMON
EJECT PLAY
C
(FWD) REW
(REV) FF
R

SENSE P. C. BOARD (A) SENSE P. C. BOARD (B)

FM FRONT END IC2

1	2	3	4	5	6	7	8	9	10
	0V				0V	3.3V	3.3V		0V
11	12	13	14	15	16	17	18	19	20
	8.5V	8.2V	3.2V	0V	2.5V			0V	

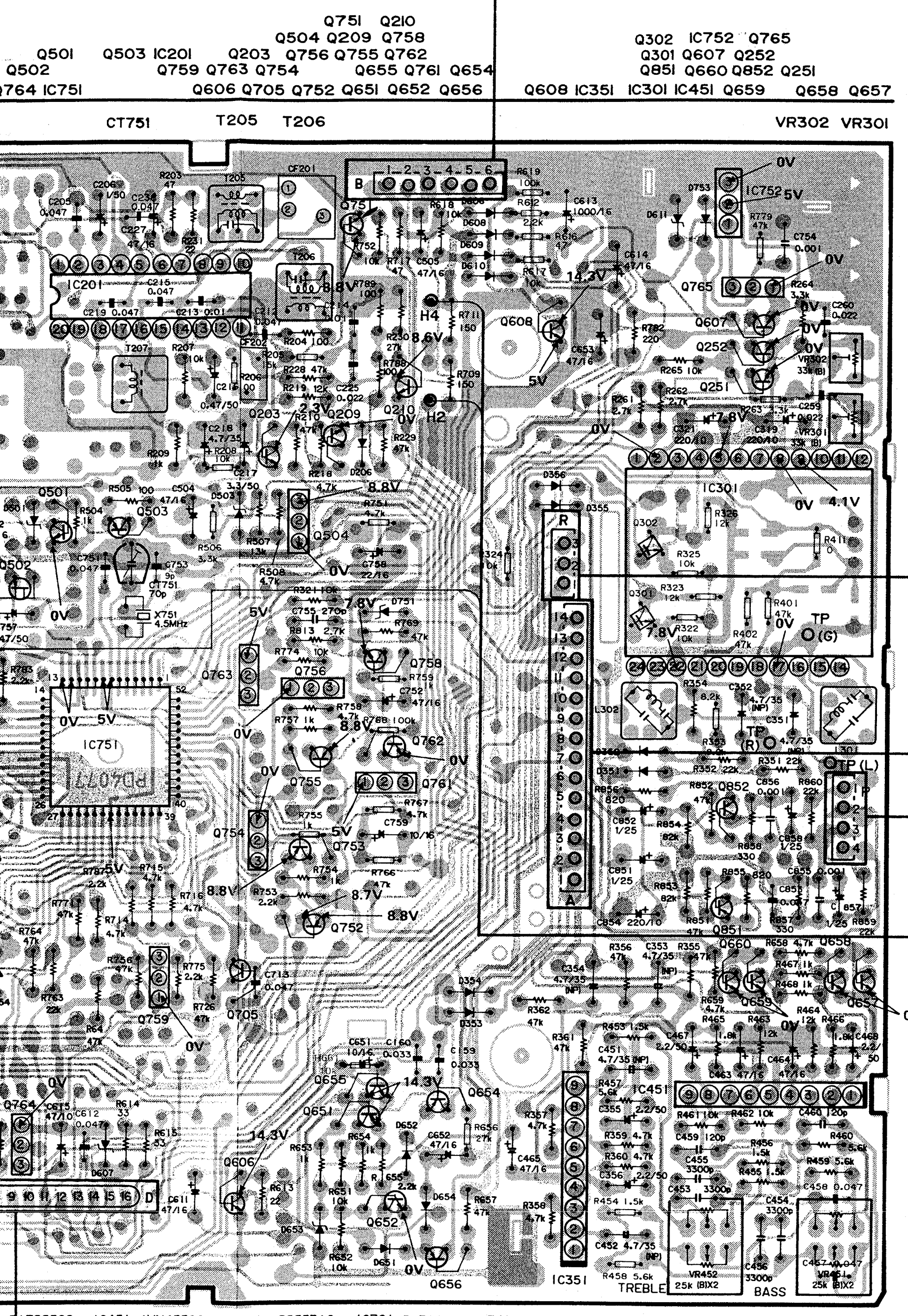
FM UNIT IC51

1	2	3	4	5	6	7	8
2.6V	2.6V		0V	2.1V	0.7V	5V	5V
9	10	11	12	13	14	15	16
5V	0V	5V		5V	3.7V	0.6V	4V

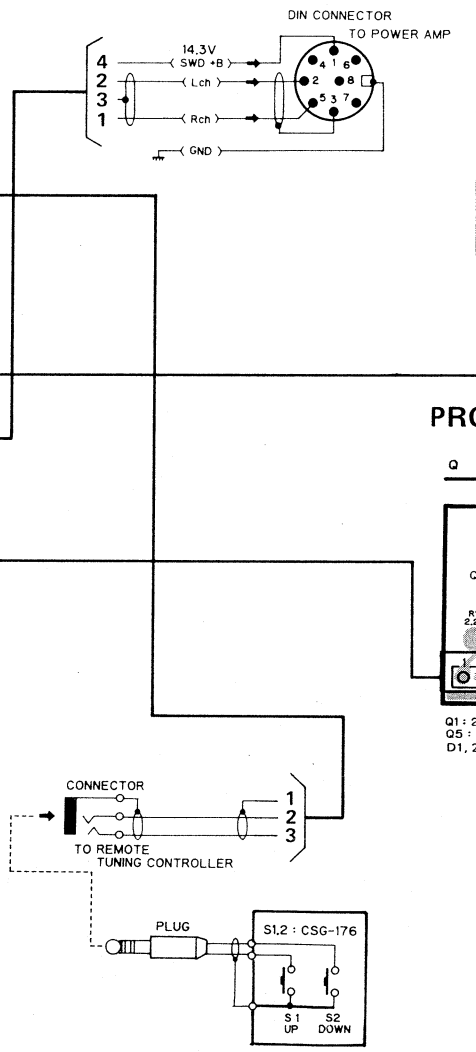
FM UNIT IC151

1	2	3	4	5	6	7
	8.7V	1V		3V	5V	0V
8	9	10	11	12	13	
0V	0V	2.4V	5V	3.7V	3.7V	

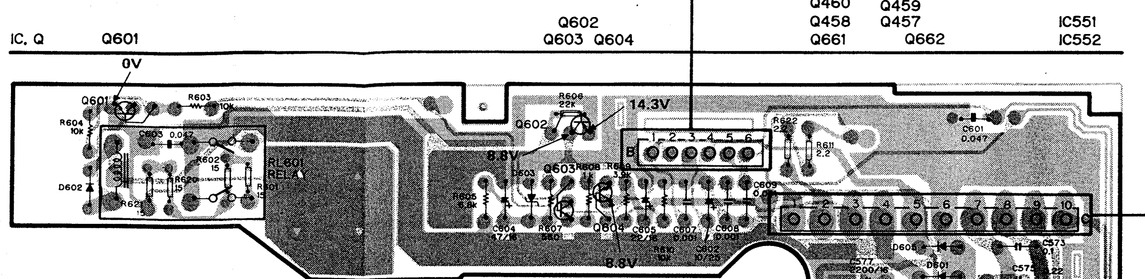
T (CWE1027)


Q501 Q503 IC201 Q203 Q756 Q755 Q762
Q502 Q759 Q763 Q754
Q764 IC751 Q606 Q705 Q752 Q651 Q652 Q656
Q751 Q210 Q504 Q209 Q758 Q655 Q761 Q654
Q608 IC351 IC301 IC451 Q659 Q658 Q657
Q302 IC752 Q765 Q301 Q607 Q252 Q851 Q660 Q852 Q251
CT751 T205 T206 VR302 VR301
IC751 PD4077
IC301 IC351 IC451
TREBLE BASS
VR452 25k (B)X2
VR451 25k (B)X2

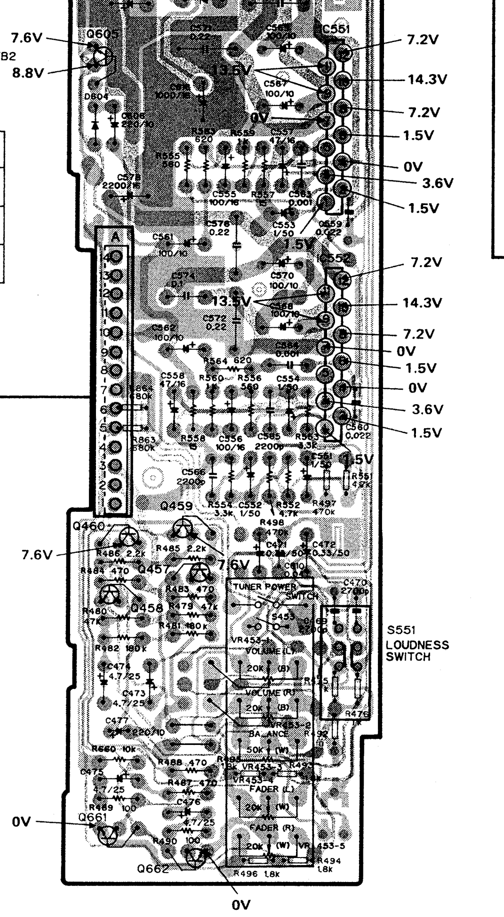
:TA75558S IC451 : NJM4558S IC501 : μPB553AC IC701 : PA3019 IC751 : PD4077 C IC752 : MN1280-L
52, 655, 702, 703, 705, 751, 758, 760, 762 : 2SC1740S or 2SC2458
4, 656, 753, 755, 851, 852 : 2SA1048 Q504, 754, 756, 759, 764 : UN4212 or DTC124ES Q606 : 2SC2458
or DTA114ES Q752 : 2SA1150 Q761, 763, 765 : UN4113 or DTA144ES
3, 754 : US1040M, 1SS176 or 1SS133 D203, 204 : 1S1555 D205 : KV1235Z3 or KV1235Z5 D501 : HZS2R7EB1, B2 or RD2R7ESB1, B2
or HZS5R1EB1, B2 D653 : HZS8R2JB2, B3 or RD8R2JSB2, B3 D701 : HZS7R5JB1 or RD7R5JSB1 D751 : HZS8R2JB1 or RD8R2JSB1

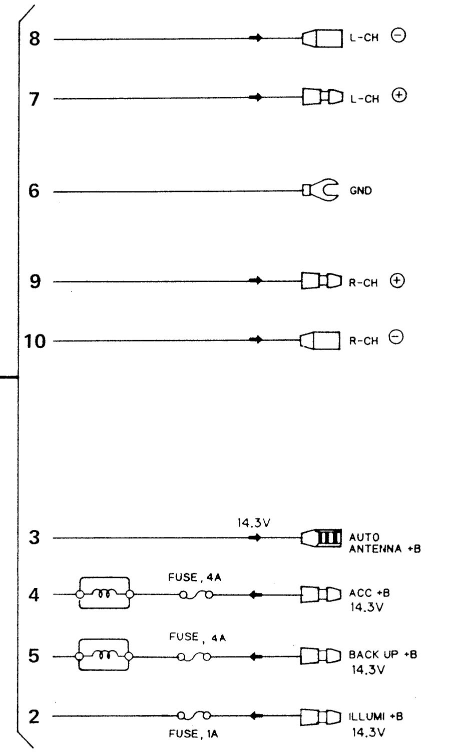

DIN CONNECTOR
TO POWER AMP
4 14.3V (SWD +B)
2 (Lch)
3 (Rch)
1 (GND)
CONNECTOR
TO REMOTE TUNING CONTROLLER
1
2
3
PLUG
S1,2 : CSG-176
S1 UP
S2 DOWN

MAIN AMP UNIT (CWH1020)


IC, Q Q601 Q602 Q603 Q604 Q460 Q458 Q661 Q459 Q457 Q662 IC551 IC552
0V
14.3V
8.8V
RL601 RELAY

IC551, 552 : TA7270P Q457~460, 601, 603~605 : 2SC2458 or 2SC536SP Q602 : 2SB941
Q661, 662 : 2SD1468S or 2SD1012
D601, 605 : ERA15-02VH or SM-1A-02LFD D602, 604 : US1040M, 1SS133 or 1SS176 D603 : RD6R2ESB2 or HZS6R2EB2


7.6V
8.8V
7.2V
14.3V
7.2V
1.5V
0V
3.6V
1.5V
7.2V
14.3V
7.2V
0V
1.5V
0V
3.6V
1.5V
7.6V
0V
0V
S551 LOUDNESS SWITCH
VOLUME
BALANCE
FADER


8 L-CH ⊖
7 L-CH ⊕
6 GND
9 R-CH ⊕
10 R-CH ⊖
3 14.3V AUTO ANTENNA +B
4 FUSE, 4A ACC +B 14.3V
5 FUSE, 4A BACK UP +B 14.3V
2 FUSE, 1A ILLUMI +B 14.3V

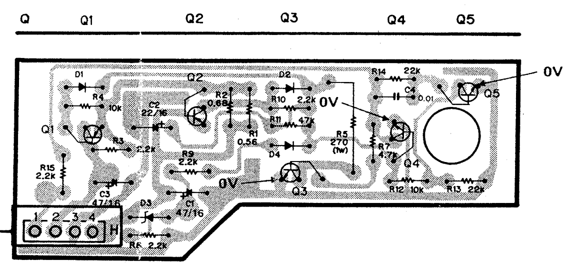
TUNER UNIT IC201

1	2	3	4	5	6	7	8	9	10
5.0V	2.1V	0.6V	0V	0V	2.1V	8.6V	8.6V	0.9V	8.6V
11	12	13	14	15	16	17	18	19	20
0.7V	0V	2.3V	8.6V	1.3V	0.4V	2.3V	5.7V	5.7V	3.0V

TUNER UNIT IC451

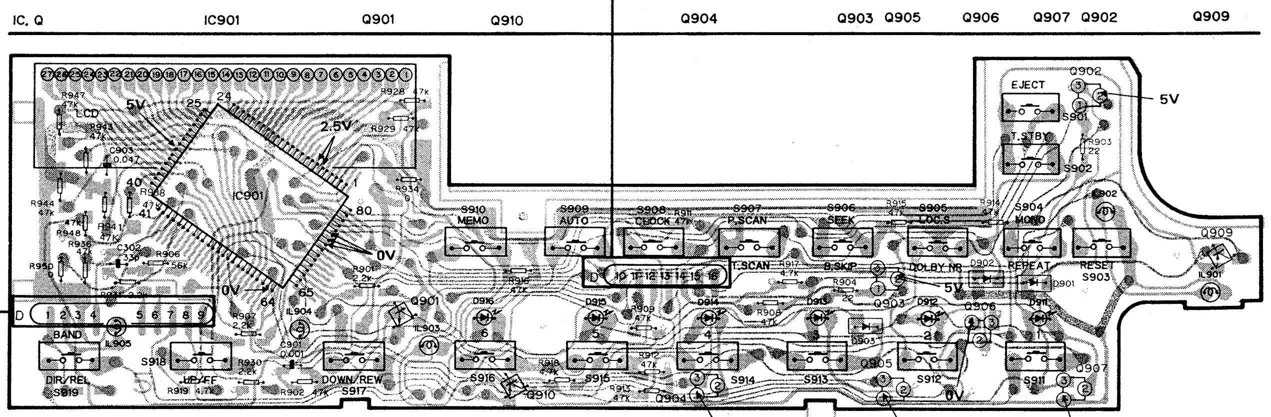
1	2	3	4	5	6	7	8	9
8.8V	4.8V	4.8V	4.8V	0V	4.8V	4.8V	4.8V	╱

PROTECTIVE CIRCUIT UNIT (CWM1191)


Q Q1 Q2 Q3 Q4 Q5
0V
0V
0V
H

Q1 : 2SB1066MF Q2 : 2SA1048 or 2SA608SP Q3, 4 : 2SC2021F
Q5 : 2SC1740S or 2SC2458
D1, 2, 4 : US1040M, 1SS133 or 1SS176 D3 : RD22JSB2 or HZS22JB2

SWITCH UNIT (CWS1028)


IC, Q IC901 Q901 Q910 Q904 Q903 Q905 Q906 Q907 Q902 Q909
5V
2.5V
0V
10V
EJECT
T.STB
MEMO
AUTO
CLOCK
F.SCAN
SEEK
LOCAL
MONO
RESET
T.SCAN
B.SKIP
DOLBY NR
REPEAT
BAND
DIR/REL
UP/FF
DOWN/REW
0V
0V
0V

IC901 : PD4078C Q901 : 2SD601-YQ or 2SC2712-LG Q902~907 : UN2216 or DTC143TK Q909, 910 : 2SB709-AQ or 2SA1179-M4
D901~903 : MA151K D911~916 : SLR-320MT3

T IC151

2	3	4	5	6	7
3.7V	1V	╱	3V	5V	0V
9	10	11	12	13	
0V	2.4V	5V	3.7V	3.7V	

TUNER UNIT IC351

1	2	3	4	5	6	7	8	9
╱	4.8V	4.8V	4.8V	0V	4.8V	4.8V	4.8V	4.8V

TUNER UNIT IC251

1	2	3	4	5	6	7	8	9
1.2V	0.7V	2.8V	7.8V	0V	2.8V	0.7V	1.2V	╱

18. CABINET EXPLODED VIEW

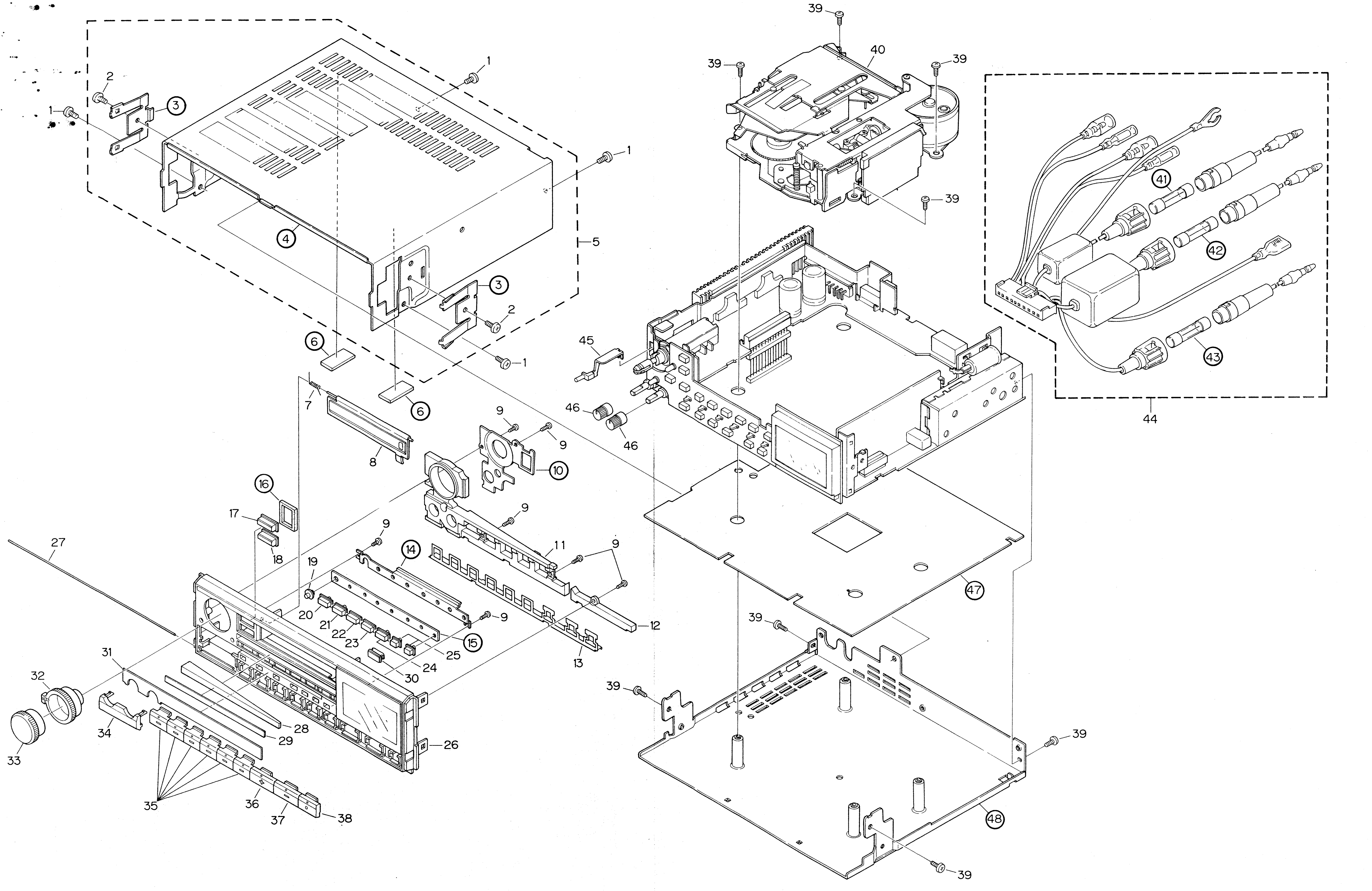

A
B
C
D
1
2
③
④
5
⑥
7
8
9
⑩
11
12
13
⑭
⑮
⑯
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
㊶
㊷
㊸
44
45
46
㊼
㊽

Fig. 48

- **Parts List**

NOTE:
- *For your parts*
marks ★★ and
★★: GENERAL
This classificat
model number,
- *Parts whose pa*
- *Parts marked*
longer than us

Mark	No.	Par
	1.	BM
	2.	BM
	3.	
	4.	
	5.	CX
	6.	
	7.	CB
	8.	CA
		CA
	9.	BP
	10.	
	11.	CN
	12.	CN
	13.	CB
	14.	
	15.	
	16.	
★	17.	CA
★	18.	CA
★	19.	CA
★	20.	CA
★	21.	CA
★	22.	CA
★	23.	CA
★	24.	CA
		CA
★	25.	CA

- **Parts List**

NOTE:
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Mark	No.	Part No.	Description
	1.	BMZ30P050FMC	Screw
	2.	BMZ30P050FNI	Screw
	3.		Sping
	4.		Case
	5.	CXA1324	Case Unit
	6.		Spacer
	7.	CBH-682	Spring
	8.	CAT1018	Door (KEH-9030SDK/WG, 9030/EW)
		CAT1037	Door (KEH-9020/US, CA, G)
	9.	BPZ20P040FBK	Screw
	10.		Holder
	11.	CNV1121	Lens
	12.	CNV1118	Lens
	13.	CBL1021	Spring
	14.		Holder
	15.		Cushion
	16.		Cushion
★	17.	CAC1089	Button (EJECT)
★	18.	CAC1088	Button (TAPE STBY)
★	19.	CAC-998	Button (RESET)
★	20.	CAC1215	Button (MONO/REPEAT)
★	21.	CAC1095	Button (LOC.S/DOLBYNR)
★	22.	CAC1094	Button (SEEK/BLANK SKIP)
★	23.	CAC1216	Button (PRESET SCAN/ TAPE SCAN)
★	24.	CAC1218	Button (SDK) (KEH-9030SDK/WG)
		CAC1091	Button (CLOCK) (KEH-9020/US, CA, G)
★	25.	CAC1092	Button (AUTO MEMO, MEMO)
	26.	CXA1317	Grille Unit (KEH-9020/US, CA, G)
		CXA1318	Grille Unit (KEH-9030/EW)
		CXA1319	Grille Unit (KEH-9030SDK/WG)
	27.	CLA1103	Shaft
	28.	CNV1122	Lens
	29.	CNS1079	Plate (KEH-9030SDK/WG)
		CNS1163	Plate (KEH-9020/US, CA, G)
		CNS1182	Plate (KEH-9030/EW)
★	30.	CAC1217	Button (KEH-9030/EW)
	31.	CNS1080	Plate
★	32.	CAA1046	Knob (FADER)
★	33.	CAA-502	Knob (VOLUME, BALANCE, POWER SWITCH)
★	34.	CAC1087	Button
★	35.	CAC1083	Button (PRESET)
★	36.	CAC1085	Button (DOWN/REW)
★	37.	CAC1086	Button (UP/FF)
★	38.	CAC1084	Button (BAND/DIR/REL)
	39.	BMZ26P050FMC	Screw
◉	40.	CXK1635	Cassette Mechanism Assy
	41.		Fuse, 4A
	42.		Fuse, 4A
	43.		Fuse, 1A
	44.	CDE1278	Cord Assy (KEH-9030SDK/WG)
		CDE1279	Cord Assy (KEH-9030/EW, 9020/US, CA, G)
	45.	CXA1339	Button Unit
	46.	CAA1022	Knob (BASS, TREBLE)
	47.		Insulator
	48.		Chassis

Fig. 48

19. CHASSIS EXPLODED VIEW

- **Parts List**

Mark	No.	Part No.	Description
	1.	CNV1123	Housing
	2.	CNV1124	Lens
	3.		Spacer
★	4.	CAW1010	LCD (KEH-9030SDK/WG, 9030/EW)
		CAW1002	LCD (KEH-9020/US, CA, G)
	5.		Holder
	6.	BMZ26P050FMC	Screw
	7.		Spacer
	8.		Frame
	9.		Spacer
◉	10.	CWS1025	Switch Unit (KEH-9030SDK/WG)
		CWS1026	Switch Unit (KEH-9030/EW)
		CWS1027	Switch Unit (KEH-9020/US, CA)
		CWS1028	Switch Unit (KEH-9020/G)
	11.	CNP1082	P.C. Board
★★	12.	CEL-147	Lamp, 14V 40mA (KEH-9030SDK/WG, 9030/EW)
		CEL1013	Lamp, 14V 40mA (KEH-9020/US, CA, G)
	13.		Spacer
	14.	CNW-855	Bush
★★	15.	CEL1010	Lamp, 14V 40mA
★★	16.	CSG-253	Switch
★★	17.	CSG-253	Switch (SDK, CLOCK) (KEH-9030SDK/WG, 9020/US, CA, G)
★	18.	SLR-320MT3	LED
	19.	BMZ26P100FMC	Screw
	20.		Heat Sink
★★	21.	TA7270P	IC (IC551, 552)
	22.		Insulator
◉	23.	CWH1019	Main Amp Unit (KEH-9030SDK/WG)
		CWH1020	Main Amp Unit (KEH-9030/EW, 9020/G)
		CWH1023	Main Amp Unit (KEH-9020/US, CA)
	24.	BMZ26P060FMC	Screw
★★	25.	2SB941	Transistor (Q602)
	26.		Holder
	27.	CKS-467	Plug (10P)
	28.		Connector (14P)
★★	29.	CSG-207	Switch (LOUDNESS)
★★	30.	CCS1014	Volume/Switch Volume, 20kΩ(B), 50kΩ(W), 20kΩ(W) (VOLUME, BALANCE, FADER, POWER)
	31.	CBE1012	Spacer
	32.		Holder
	33.	NK100FMC	Nut
	34.	HKS-195	Connector (6P)
	35.	CSR-051	Relay (RL601)
	36.	CNW-770	Cap
	37.	CDE1308	DIN Connector
	38.	CDE1259	REMOTE Control Cord
	39.		Holder
★★	40.	BH-2401B	IC (IC301)
★★	41.	CCS1020	Volume, 25kΩ (B) (BASS, TREBLE)
	42.		Plug (14P)
	43.	CKS-269	Plug (4P)
	44.	CKS-683	Plug (3P)
	45.		Connector (20P)
	26.		Plug (6P)
	47.	CDF-704	Connector (3P) (KEH-9020/US, CA)
	48.		Holder
	49.	CKX-006	Antenna Jack
★★	50.	CSH1002	Switch (GAIN SELECTOR) (KEH-9020/US, CA)
	51.		Insulator (KEH-9030SDK/WG)
	52.		Holder (KEH-9030SDK/WG, 9030/EW)
	53.	CWB1004	FM Front End (KEH-9030SDK/WG, 9030/EW)
		CWB1006	FM Front End (KEH-9030/US, CA, G)
	54.		Shield Plate (KEH-9030SDK/WG)
	55.		Heat Sink
◉	56.	CWE1025	Tuner Unit (KEH-9030SDK/WG)
		CWE1026	Tuner Unit (KEH-9030/EW)
		CWE1027	Tuner Unit (KEH-9020/G)
		CWE1043	Tuner Unit (KEH-9020/US, CA)
	57.	CNN-412	Cushion
	58.		Plug (10P) (KEH-9020/US, CA, G, 9030/EW)
	59.		Plug (16P) (KEH-9030SDK/WG)
	60.		Connector (10P) (KEH-9020/US, CA, G, 9030/EW)
	61.		Connector (16P) (KEH-9030SDK/WG)
◉	62.	CWE1019	FM Unit (KEH-9030SDK/WG)
		CWE1020	FM Unit (KEH-9030/EW)
		CWE1021	FM Unit (KEH-9020/US, CA)
		CWE1022	FM Unit (KEH-9020/G)
	63.		Holder
◉	64.	CWM1191	Protective Circuit Unit
	65.		Connector (4P)

- **Chassis**

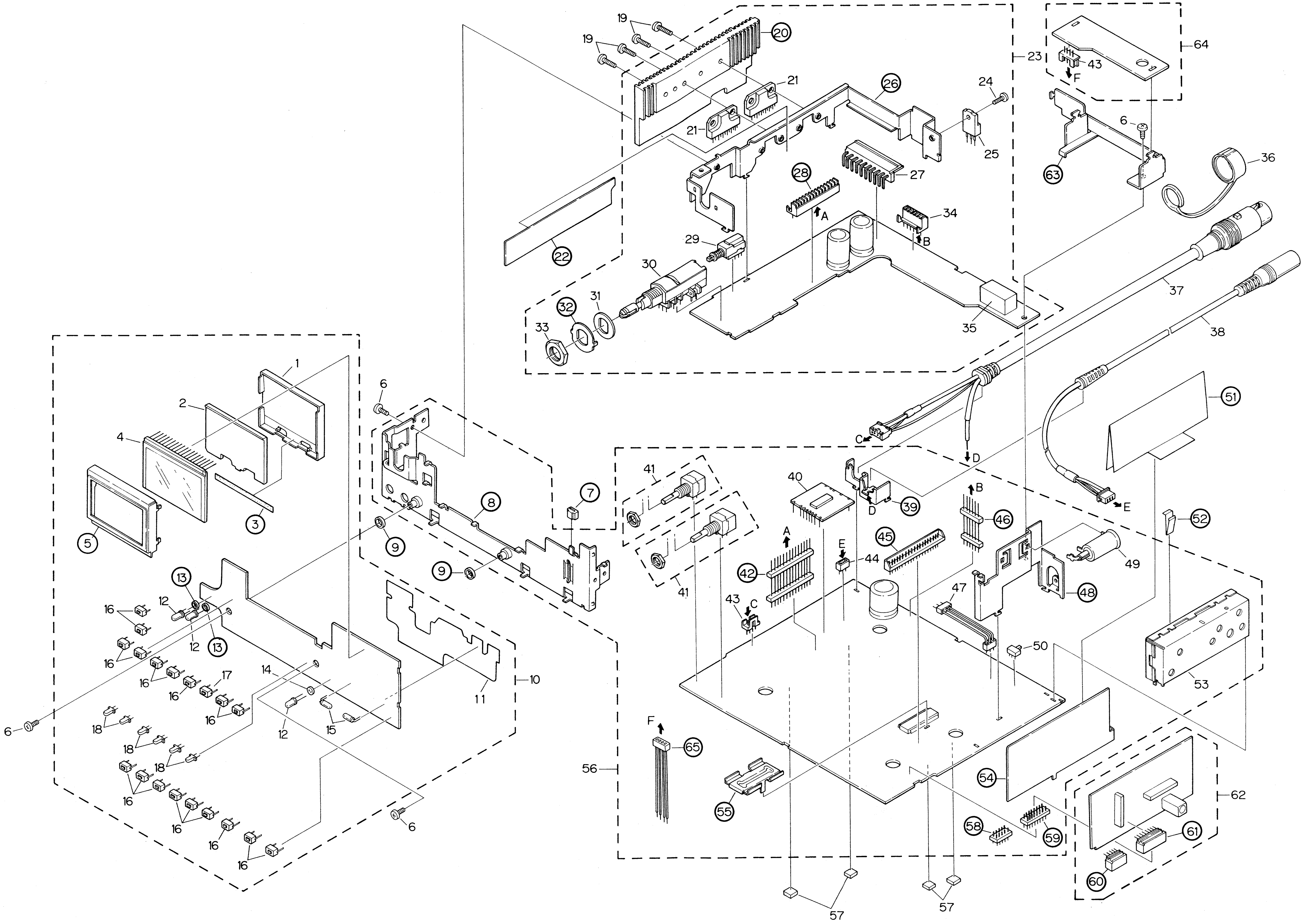

19
19
20
21
21
22
23
24
25
26
27
28
A
29
30
31
32
33
34
B
35
36
37
38
64
43
F
6
63
1
2
3
4
5
6
7
8
9
9
10
11
12
12
12
13
13
14
15
16
16
16
16
16
16
16
16
16
17
18
18
18
6
6
C
D
39
D
40
41
41
42
A
43
C
44
E
45
46
B
47
48
49
50
51
52
E
53
54
55
56
57
57
58
59
60
61
62
65
F

Fig. 49

20. CASSETTE MECHANISM ASSEMBLY EXPLODED VIEW

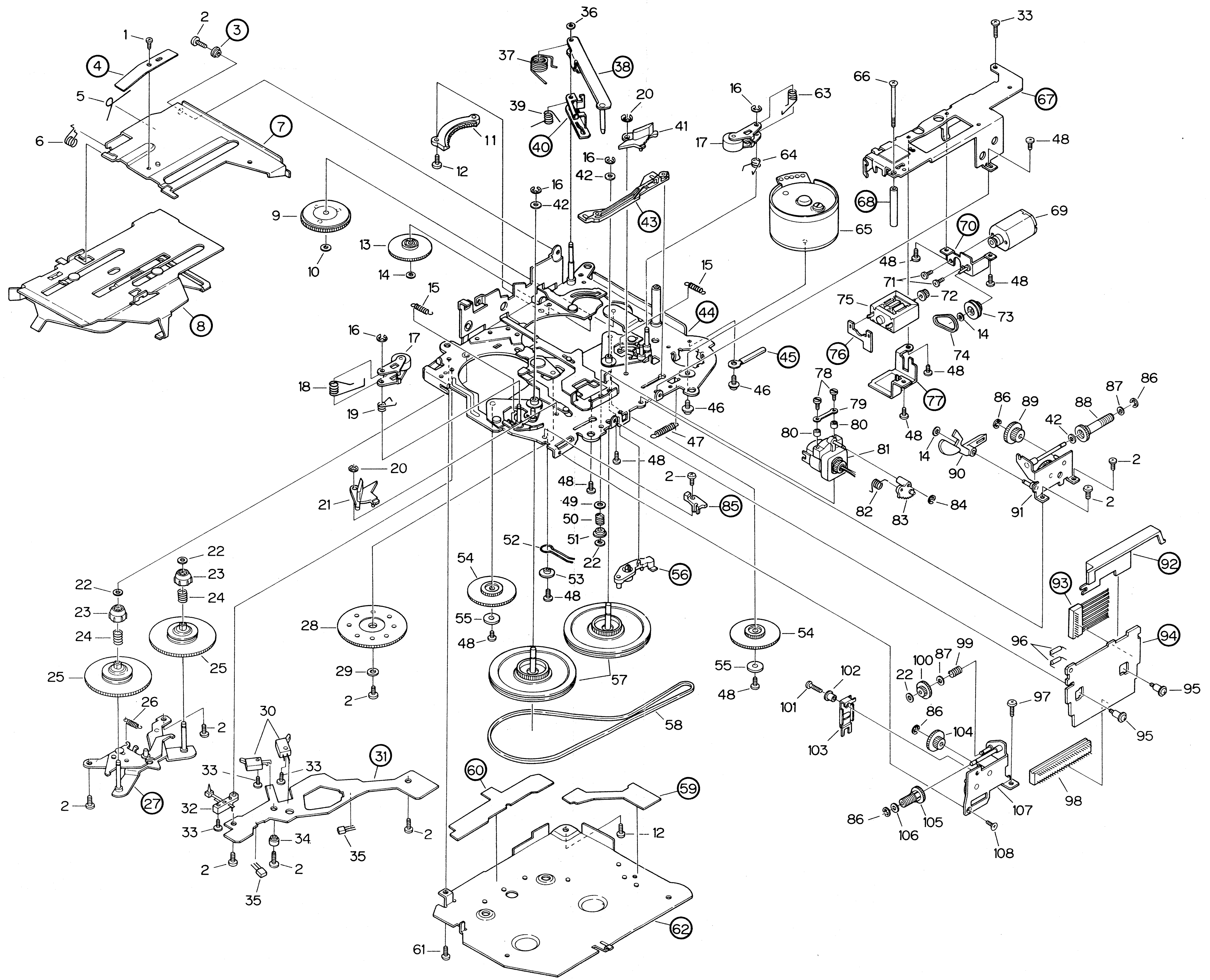

A
B
C
D
36
33
2
3
1
37
38
66
67
4
20
16
63
39
5
41
17
48
11
7
6
40
16
64
12
42
16
42
43
68
69
9
65
70
48
13
10
14
15
71
48
15
72
75
44
73
14
8
16
17
45
76
74
48
18
46
77
78
86
87
86
79
46
89
88
42
19
80
80
47
48
81
14
2
48
90
20
2
49
82
83
84
91
2
21
85
50
51
52
22
22
54
53
56
23
48
92
22
93
24
23
28
55
54
94
24
48
96
25
99
29
55
87
100
25
57
22
102
95
2
48
101
26
2
58
86
97
30
104
103
95
31
33
33
98
60
59
107
32
27
86
105
2
33
34
2
12
106
35
108
2
2
35
62
61
A
B
C
D

Fig. 50

- **Parts List**

Mark	No.	Part No.	Description
	1.	HBA-147	Screw, M1.4 x 1.4
	2.	BMZ20P040FMC	Screw
	3.		Bush
	4.		Spring
	5.	CBH-867	Spring
	6.	CBH-837	Spring
	7.		Arm
	8.		Holder Unit
	9.	CXD-900	Gear Unit
	10.	HBF-119	Washer
	11.	CNV1075	Gear
	12.	CBA1004	Screw
	13.	CNY-271	Gear
	14.	CBF-126	Washer
	15.	CBH-835	Spring
	16.	CBG1001	E type washer
	17.	CXD-387	Pinch Roller Unit
	18.	CBH-832	Spring
	19.	CBH-834	Spring
	20.	YE25FUC	E type washer
	21.	CNW-930	Arm
	22.	CBF-135	Washer
	23.	CNW-932	Collar
	24.	CBH-827	Spring
★★	25.	CXD-877	Reel Unit
	26.	CBH-868	Spring
	27.		Bracket Unit
	28.	CNW-944	F/R Gear
	29.	CLA1109	Collar
★★	30.	CSN-091	Switch (70μS, CST IN)
	31.		P.C. Board
★★	32.	CSN-089	Switch (CST SET)
	33.	CBA-172	Screw
	34.	CLA1087	Collar
★	35.	SDME106A	Magnetic Resistive Device
	36.	CBF-046	Washer
	37.	CBH-887	Spring
	38.		Arm Unit
	39.	CBH-886	Spring
	40.		Arm
	41.	CNW-931	Arm
	42.	HBF-179	Washer
	43.		Lever
	44.		Chassis Unit
	45.		Clamper
	46.	PMS26P030FMC	Screw
	47.	CBH-830	Spring
	48.	HBA-175	Screw
	49.	CBE-123	Washer
	50.	CBH-902	Spring
	51.	HNC-953	Holder
	52.	CBH-893	Spring
	53.	CLA1110	Collar
	54.	CNV1178	Gear
	55.	CLA1108	Collar
	56.		Clamper
	57.	CXA1015	Flywheel
★★	58.	CNT-111	Belt
	59.		Insulator
	60.		Insulator
	61.	BMZ20P030FMC	Screw
	62.		Cover
	63.	CBH-831	Spring
	64.	CBH-833	Spring
★★	65.	CXM1007	Motor (Capston)
	66.	CBA-165	Screw, M2 x 25
	67.		Guide
	68.		Spacer
★★	69.	CXM-452	Motor (Head Position)
	70.		Bracket Unit
	71.	HBA-244	Screw
	72.	CNW-941	Gear
	73.	CNY-075	Pulley
★★	74.	CNT-114	Belt
★★	75.	CXM-351	Motor (Gear Position)
	76.		P.C. Board
	77.		Bracket
	78.	CBA-173	Screw, M1.4 x 8
	79.	CBE-114	Spring
	80.	CNY-134	Azimuth Rubber
★★	81.	CXA1214	Head Unit
	82.	CBH-829	Spring
	83.	CNW-939	Gear
	84.	YE15FUC	E type washer
	85.		Spacer
	86.	YE12FUC	E type washer
	87.	HBF-116	Washer
	88.	CNW-956	Gear
	89.	CNW-955	Gear
	90	CNV1260	Arm
	91.	CXA1432	Holder Assy
	92.		Holder
	93.		Connector (8P)
	94.		P.C. Board
	95.	CBA1022	Screw
★	96.	1S1555	Diode
	97.	BMZ20P060FMC	Screw
	98.	CKS-678	Connector (40P)
	99.	CBH-866	Spring
	100.	CNW-954	Gear
	101.	HBA-158	Screw
	102.	CLB-750	Collar
	103.	CNH-004	Arm
	104.	CNY-077	Gear
	105.	CNY-148	Gear
	106.	CBF-088	Washer
	107.	CXA1433	Holder Assy
	108.	HBA-209	Screw

21. ELECTRICAL PARTS LIST

NOTE:
When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω 56 × 10^1 561 .... RD1/4PS $\boxed{5}\boxed{6}\boxed{1}$ J
47kΩ 47 × 10^3 473 .... RD1/4PS $\boxed{4}\boxed{7}\boxed{3}$ J
0.5Ω 0R5 .... RN2H $\boxed{0}\boxed{R}\boxed{5}$ K
1Ω 010 .... RS1P $\boxed{0}\boxed{1}\boxed{0}$ K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ 562 × 10^1 .... RN1/4SR $\boxed{5}\boxed{6}\boxed{2}\boxed{1}$ F

- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*
  Chip Resistor
  RS1/8S□□□J
  Chip Capacitor (except for CQS.....)
  CKS....., CCS.....

FM Front End

FM Front End	Model
CWB1004	KEH-9030SDK/WG, EW
CWB1006	KEH-9020/US, CA, G

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC1	CWW-173 or CWW1015
★★	IC2	PA4009
★★	Q1, 3	2SK241
★★	Q2	2SC2753 or 2SC2570
★	D1	*KV1310A-3
	L1 Coil	CTC1001
	L2 Coil	CTC1002
	L3 Coil	CTC1003
	L4 Chip Inductor	CTF-185
	T1 Coil	CTC1005
	T2 Coil	CTC1004
	CF1, 2 Ceramic Filter (CWB1004)	CTF-182
	CF1, 2 Ceramic Filter (CWB1006)	CTF101

*KV1310A-3 consists of 3 parts. Separate it into 3 parts before installation. (Be sure to replace 3 parts at a time.)

RESISTORS

Mark	Symbol & Description	Part No.
	R1, 2, 5 – 12, 14	RS1/8S□□□J
	R13	RD1/6PS□□□J or RD1/4PS□□□JL

CAPACITORS

Mark	Symbol & Description	Part No.
	C1	CCSSH330J50
	C2	CCSSH390J50
	C3	CCSCH060D50 or CCSCH060C50
	C4	CCSTH060C50 or CCSTH060D50
	C5, 11, 15, 20	CKSYB222K50
	C6	CCSCH040C50
	C7, 10	CKSYB103K50
	C8	CCSCH100D50
	C9	CCSSH560J50
	C12, 18	CCSTH150J50
	C13	CCSTH330J50
	C14	CCSTH100D50
	C16, 19, 21	CKSYB223K50
	C17	CCSUJ080D50
	C22	CEA2R2M35LS
	C23	CEA3R3M25LS
	C24	CCSSH030C50

Tuner Unit

Tuner Unit	Model
CWE1025	KEH-9030SDK/WG
CWE1026	KEH-9030/EW

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC201	LA1135
★★	IC251	M51522AL
★★	IC301	BH-2401B
★★	IC351	TA75558S
★★	IC451	NJM4558S
★★	IC501	μPB553AC
★★	IC701	PA3019
★★	IC751	PD4077C
★★	IC752	MN1280-L
★★	Q201	2SK435
★★	Q202, 203, 209, 210, 251, 252, 402, 403, 501, 607, 608, 652, 655, 702, 703, 705, 751, 758, 760, 762,	2SC1740S or 2SC2458
★★	Q204 – 208, 606	2SC2458
★★	Q301, 302 Chip Transistor	2SD601-YQ or 2SD601-YR or 2SD601-YS or 2SC2712-LG or 2SC2712-LL or 2SC2712-LY
★★	Q502	2SK330
★★	Q503, 651, 654, 656, 753, 755, 851, 852	2SA1048
★★	Q504, 754, 756, 759, 764, 766 – 768	UN4212 or DTC124ES
★★	Q657 – 660	2SD1468S or 2SD1012
★★	Q701	2SD1055F
★★	Q704	UN4111 or DTA114ES
★★	Q752	2SA1150
★★	Q761, 763, 765	UN4113 or DTA144ES
★★	Q802, 805 (KEH-9030SDK/WG)	2SC1740S or 2SC2458
★★	Q803, 804 (KEH-9030SDK/WG)	UN4212 or DTC124ES
★	D201, 202, 206, 351 – 356, 401, 606, 608 – 610, 651, 652, 654, 702, 703, 753, 754, 801, 802	US1040M or 1SS133 or 1SS176
★	D203, 204	1S1555
★	D205	KV1235Z3 or KV1235Z5
★	D501	HZS2R7EB1 or HZS2R7EB2 or RD2R7ESB1 or RD2R7ESB2
★	D503, 611	HZS5R6JB2 or HZS5R6JB3 or RD5R6JSB2 or RD5R6JSB3
★	D504, 607	RD5R1ESB1 or RD5R1ESB2 or HZS5R1ES1 or HZS5R1EB2
★	D653	HZS8R2JB2 or HZS8R2JB3 or RD8R2JSB2 or RD8R2JSB3
★	D701	HZS7R5JB1 or RD7R5JSB1
★	D751	HZS8R2JB1 or RD8R2JSB1
	L1 Ferri-Inductor, 15μH	CTF1013
	L301, 302 Coil	CTF-253
	T201 Coil	CTB-149
	T202 Coil	CTB-167
	T203, 204 Coil	CTB-172
	T205 Coil	CTE-159
	T206 Coil	CTE-160
	T207 Coil	CTB1001
	T208, 209 Coil	CTB-175
	T210 Coil	CTB-165
	CF201 Filter	CTF-100 or CTF-240
	CF202 Ceramic Filter	CTF-247
	X751 X'tal, 4.5MHz	CSS-046
★★	VR301, 302 Semi-fixed, 33kΩ (B)	CCP-381
★★	VR451, 452 Volume, 25kΩ (B) (TREBLE, BASS)	CCS1020

RESISTORS

Mark	Symbol & Description	Part No.
	R201, 203, 204, 207, 209, 210, 218, 219, 228 – 231, 257 – 262, 264, 265, 321, 351, 352, 354 – 362, 407, 453, 455 – 457, 459 – 468, 501, 504, 505, 507, 508, 510, 511, 613 – 615, 618, 651 – 655, 657 – 660, 708, 709, 711, 713 – 717, 722 – 726, 752 – 759, 762 – 764, 769, 771, 774 – 776, 782 – 784, 787 – 789, 813 – 816, 851 – 860	RD1/4PS□□□JL
	R202, 205, 206, 208, 211, 212, 214 – 217, 220, 221, 223 – 226, 251, 252, 255, 256, 263, 321 – 326, 353, 401, 402, 408 – 412, 454, 458,	RS1/8S□□□J

Mark	Symbol & Description	Part No.
	502, 503, 506, 509, 612, 616, 617, 619, 656, 661, 701 – 707, 710, 712 718 – 721, 751, 765 – 768, 779, 781	
	R786, 809 (KEH-9030SDK/WG)	RS1/8S□□□J
	R814 – 816, 818, 820 (KEH-9030SDK/WG)	RD1/4PS□□□JL

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, 218	CEA4R7M35LS
	C159, 160	CKSYB123K50
	C202	CKPYX222M16L
	C203, 205, 211, 212, 215, 230, 231, 235	CKSYF473Z50
	C204, 227, 463, 464, 505	CEA470M16L2
	C206, 851, 852, 857, 858	CEA010M50L2
	C207, 210	CCSSH100D50
	C208, 223, 225, 259, 260	CKSYB223K25
	C209	CCSCH010C50
	C213, 214, 257, 258, 503, 509	CKSYB103K50
	C216	CEAR47M50LS2
	C217	CEA3R3M50LS
	C219, 238	CKSYB473K25
	C220	CCSUJ180J50
	C221	CQPA331G100
	C222	CCSRH820J50
	C224, 507, 508	CKSYB102K50
	C229	CKDBC473K25
	C232	CCDSH390J50L
	C233	CCSCH180J50
	C234	CCDRH101G50L
	C236, 457, 458, 612, 701 – 706	CKSYF473Z50
	C237	CCSSL220J50
	C251, 252	CKSYB391K50
	C253, 254	CEANL4R7M35LL
	C255, 256	CEA220M16L2
	C261, 465, 504, 611, 752	CEA470M16LS
	C319, 321, 854	CEA221M10L2
	C351 – 354, 451, 452	CEA4R7M16NPLL
	C355, 356	CEA2R2M50L2
	C402	CKSYB392K50
	C403	CEAR15M50LS2
	C404	CCSCH330J50
	C453 – 456	CKPYX332M16L
	C459, 460	CKPYB121K50L
	C467, 468	CEA2R2M50L2
	C501, 502	CSYA100M16OS
	C506, 710	CKPYY103M16L
	C613 1000μF/16V	CCH1003
	C614, 653	CEA470M16L2
	C615, 652	CEA470M16LS
	C651, 759	CEA100M16LS
	C707, 708, 758	CEA220M16LS
	C709	CEAR68M50LS2
	C711	CEA221M16L2
	C713, 751, 853	CKSYF473Z50
	C753, 756	CCSCH090D50
	C754, 855, 856	CKPYB102K50L
	C755	CKPYB271K50L
	C757	CEAR47M50LS2
	C810 (KEH-9030SDK/WG)	CEA470M16LS
	C811 (KEH-9030SDK/WG)	CKSYF473Z50

Tuner Unit

Tuner Unit	Model
CWE1027	KEH-9020/G
CWE1043	KEH-9020/US, CA

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC201	LA1135
★★	IC251	M51522AL
★★	IC301	BH-2401B
★★	IC351	TA75558S
★★	IC451	NJM4558S
★★	IC501	μPB553AC
★★	IC701	PA3019
★★	IC751	PD4077C
★★	IC752	MN1280-L
★★	Q201	2SK435
★★	Q202, 203, 209, 210, 251, 252, 402, 403, 501, 607, 608, 652, 655, 702, 703, 705, 751, 758, 760, 762	2SC1740S or 2SC2458
★★	Q301, 302 Chip Transistor	2SD601-YQ or 2SD601-YR or 2SD601-YS or 2SC2712-LG or 2SC2712-LL or 2SC2712-LY
★★	Q502	2SK330
★★	Q503, 651, 654, 656, 753, 755, 851, 852	2SA1048
★★	Q504, 754, 756, 759, 764	UN4212 or DTC124ES
★★	Q606	2SC2458
★★	Q657 – 660	2SD1468S or 2SD1012
★★	Q701	2SD1055F
★★	Q704	UN4111 or DTA114ES
★★	Q752	2SA1150
★★	Q761, 763, 765	UN4113 or DTA144ES
★	D201, 202, 206, 351 – 356, 401, 608 – 160, 651, 652, 654, 702, 703,	US1040M or 1SS133 or

Mark	Symbol & Description	Part No.
	753, 754	1SS176
★	D203, 204	1S1555
★	D205	KV1235Z3 or KV1235Z5
★	D501	HZS2R7EB1 or HZS2R7EB2 RD2R7ESB1 or RD2R7ESB2
★	D503, 611	HZS5R6JB2 or HZS5R6JB3 or RD5R6JSB2 or RD5R6JSB3
★	D504, 607	RD5R1ESB1 or RD5R1ESB2 or HZS5R1EB1 or HZS5R1EB2
★	D653	HZS8R2JB2 or HZS8R2JB3 or RD8R2JSB2 or RD8R2JSB3
★	D701	HZS7R5JB1 or RD7R5JSB1
★	D751	HZS8R2JB1 or RD8R2JSB1
	L1 Ferri-Inductor, 15μH	CTF1013
	L301, 302 Coil	CTF-253
	T201 Coil	CTB-149
	T202 Coil	CTB-167
	T203, 204 Coil	CTB-172
	T205 Coil	CTE-159
	T206 Coil	CTE-160
	T207 Coil	CTB1001
	CF201 Filter	CTF-100 or CTF-240
	CF202 Ceramic Filter	CTF-247
	CT751 Trimmer, 70pF	CCG-070
	X751 X'tal, 4.5MHz	CSS-046
★★	VR301, 302 Semi-fixed, 33kΩ (B)	CCP-381
★★	VR451, 452 Volume, 25kΩ (B) (TREBLE, BASS)	CCS1020
★★	S851 Switch (GAIN SELECTOR) (KEH-9020/US, CA)	CSH1002

RESISTORS

Mark	Symbol & Description	Part No.
	R64, 201, 203, 204, 207, 209, 210, 218, 219, 228 – 231, 257 – 262, 264, 265, 321, 351, 352, 354 –362, 407, 453, 455 – 457, 459 – 468, 501, 504, 505, 507, 508, 510, 511, 613 – 615, 618, 651 – 655, 657 – 660, 708, 709, 711, 713 – 717, 722 – 726, 752 – 754, 756 – 758, 762 – 764, 769, 771, 774 – 776, 782, 783, 788, 789, 813, 851 – 860	RD1/4PS□□□JL
	R202, 205, 206, 208, 212, 251, 252, 255, 256, 263, 322 – 326, 353, 401, 402, 408 – 412, 254, 458, 502. 503, 506, 509, 616, 617, 619, 656, 661, 701 – 707, 710, 712, 718 – 721, 751, 755, 759, 765 – 768, 779	RS1/8S□□□J
	R861, 862 (KEH-9020/US, CA)	RS1/8S□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, 128	CEA4R7M35LS
	C159, 160	CKSYB333K25
	C202	CKPYX222M16L
	C203, 205, 211, 212, 215	CKSYF473Z50
	C204, 227, 463, 464, 505	CEA470M16L2
	C206, 851, 852, 857, 858	CEA010M50L2
	C207, 210	CCSSH100D50
	C208, 225, 259, 260	CKSYB223K25
	C209	CCSCH010C50
	C213, 214, 257, 258, 503, 509	CKSYB103K50
	C216	CEAR47M50LS2
	C217	CEA3R3M50LS
	C219, 238	CKSYB473K25
	C220	CCSUJ220J50
	C221	CQPA431G100
	C222	CCSRH101J50
	C224, 507, 508	CKSYB102K50
	C229	CKDBC473K25
	C237	CCSSL220J50
	C251, 252	CKSYB391K50
	C253, 254	CEANL4R7M35LL
	C255, 256	CEA220M16L2
	C261, 465, 504, 611, 752	CEA470M16LS
	C319, 321, 854	CEA221M10L2
	C351 – 354, 451, 452	CEA4R7M16NPLL
	C355, 356	CEA2R2M50L2
	C402	CKSYB392K50
	C403	CEAR15M50LS2
	C404	CCSCH330J50
	C453 – 456	CKPYX332M16L
	C457, 458, 612, 701 – 706	CKSYF473Z50
	C459, 460	CKPYB121K50L
	C456, 468	CEA2R2M50L2
	C501, 502	CSYA100M16OS
	C506, 710	CKPYY103M16L
	C613	CEA471M16L2
	C614, 653	CEA470M16L2
	C615, 652	CEA470M16LS
	C651, 759	CEA100M16LS
	C707, 708, 758	CEA220M16LS
	C709	CEAR68M50LS2
	C711	CEA221M16L2
	C713, 751, 853	CKSYF473Z50
	C753	CCSCH090D50
	C754, 855, 856	CKPYB102K50L
	C755	CKPYB271K50L
	C851, 852, 857, 858	CEA100M16L2

Main Amp Unit

Main Amp Unit	Model
CWH1019	KEH-9030SDK/WG
CWH1020	KEH-9030/EW KEH-9020/G
CWH1023	KEH-9020/US, CA

MISCELLANEOUS

Mark	Symbol & Description	Part No.
	IC551, 552	TA7270P
	Q455 (KEH-9030SDK/WG)	2SD1468S or 2SD1012
	Q457 – 460	2SC2458 or 2SC536SP
	Q601, 603 – 605 (KEH-9030SDK/WG)	2SC2458 or 2SC536SP
	Q601, 603 – 605 (KEH-9030/EW, 9020/US, CA, G)	2SC2458
	Q602	2SB941
	Q661, 662	2SD1468S or 2SD1012
	D601, 605	ERA15-02VH or SM-1A-02LFD
	D602, 604	US1040M or 1SS133 or 1SS176
	D603	RD6R2ESB2 or HZS6R2EB2
	RL601 Relay	CSR-051
	S551 Switch (LOUDNESS)	CSG-207
	VR453/S453 Volume/Switch Volume, 20kΩ(B), 50kΩ(W), 20kΩ(W) (VOLUME, BALANCE, FADER, POWER)	CCS1014

RESISTORS (KEH-9030SDK/WG)

Mark	Symbol & Description	Part No.
	R471, 472, 477, 479 – 490, 498, 552 – 560, 563, 564, 603 – 605, 607 – 610, 660	RD1/4PS□□□JL
	R473 – 476, 478, 492 – 497, 551, 601, 602, 606, 611, 620, 621, 863, 864	RS1/8S □□□J

RESISTORS (KEH-9030/EW, 9020/US, CA, G)

Mark	Symbol & Description	Part No.
	R475, 476, 492 – 497, 551, 601, 602, 606, 611, 612, 620, 621, 863, 864	RS1/8S□□□J
	R479 – 490, 498, 552 – 560, 563, 564, 603 – 605, 607 – 610, 660	RD1/4PS□□□JL

CAPACITORS

Mark	Symbol & Description	Part No.
	C469, 470	CKSYB272K50
	C471, 472	CEAR33M50L2
	C473 – 476	CEA4R7M25L2
	C477	CEA221M10L2
	C551 – 554	CEAUH010M50
	C555, 556, 561, 562, 567 – 570	CEAUH101M10
	C557, 558	CEAUH470M16
	C559, 560	CKSYB223K25
	C563, 564, 607 – 609	CKPYB102K50L
	C565, 566	CKPYX222M16L
	C571, 572, 575, 576	CQFA224J50L
	C573, 574	CQMA104K50L
	C577, 578 2200μF/16V	CCH1001
	C601, 603, 610	CKSYF473Z50
	C602	CEA100M25L2
	C604	CEA470M16L2
	C605	CEA220M16L2
	C606	CEA221M10L2
	C616	CEA102M16L2

FM Unit

FM Unit	Model
CWE1019	KEH-9030SDK/WG

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC51	LA1140B
★★	IC101	KHA115
★★	IC151	MX3S400
★★	IC801	KHA132
★★	IC802	TA75558S
★★	Q51, 53, 801	2SC2458 or 2SC1740S
★	D151	US1040M or 1SS133 or 1SS176
	T51 Coil	CTC-198
	T801 Coil	CTF-125
	L51 Ferri-Inductor, 15μH	CTF1013
	CF51 FM Ceramic Filter	CTF-182
★★	VR101 Semi-fixed, 15kΩ (B)	CCP-246
★★	VR51, 151 Semi-fixed, 150kΩ (B)	CCP-252
★★	VR152, 801 Semi-fixed, 15kΩ (B)	CCP-323
	X801 X'tal, 456kHz	CSS1002

RESISTORS

Mark	Symbol & Description	Part No.
	R51 –53, 55, 56, 59, 102, 103, 804, 806, 807	RD1/4PS□□□JL
	R57, 58, 60 – 62, 65, 101, 801 – 803, 805, 808, 817	RS1/8S□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C51	CKSYB223K25
	C52 – 54, 59	CKSYF473Z50
	C55, 62	CCSSL330J50
	C56, 63	CEAR47M50L2
	C57, 812	CKSYB103K50
	C58	CEA010M50L2
	C60	CCSSL101J50
	C64	CEA4R7M16NPLL
	C103, 801, 802	CEA470M16LS
	C105, 161	CEA470M16L2
	C152	CKSYB332K50
	C154	CKSYB153K50
	C803	CEAR47M50LS2
	C804	CKSYB102K50
	C805	CQEA683J50
	C806	CCSCH102J50
	C808	CEANLR33M50LL
	C809	CEA220M16LS

FM Unit

FM Unit	Model
CWE1020	KEH-9030/EW
CWE1021	KEH-9020/US, CA
CWE1022	KEH-9020/G

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC51	LA1140B
★★	IC101	KHA115
★★	IC151	MX3S400
★★	Q51, 53 (KEH-9030/EW)	2SC2458 or 2SC1740S
★★	Q51 –53 (KEH-9020/US, CA, G)	2SC2458 or 2SC1740S
★	D151	US1040M or 1SS133 or 1SS176
	T51 Coil	CTC-198
	L51 Ferri-Inductor, 15μH	CTF1013
	CF51 FM Ceramic Filter (KEH-9030/EW)	CTF-182
	CF51 FM Ceramic Filter (KEH-9020/US, CA, G)	CTF-101
★★	VR51 Semi-fixed, 330kΩ (B) (KEH-9020/US, CA, G)	CCP-254
★★	VR101 Semi-fixed, 15kΩ (B)	CCP-246
★★	VR151 Semi-fixed, 150kΩ (B)	CCP-252
★★	VR152 Semi-fixed, 15kΩ (B)	CCP-323

RESISTORS

Mark	Symbol & Description	Part No.
	R51 – 53, 55, 56, 59, 102, 103	RD1/4PS□□□JL
	R54, 57, 58, 60 – 62, 65, 101	RS1/8S□□□J
	R156, 157 (KEH-9020/US, CA, G)	RS1/8S□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C51	CKSYB223K25
	C52 – 54, 59	CKSYF473Z50
	C55, 62	CCSSL330J50
	C56, 63	CEAR47M50L2
	C57	CKSYB103K50
	C58	CEA010M50L2
	C60	CCSSL101J50
	C64	CEA4R7M16NPLL
	C103	CEA470M16LS
	C105, 161	CEA470M16L2
	C152	CKSYB332K50
	C154	CKSYB153K50

Switch Unit

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC902	PD4078C
★★	Q901 Chip Transistor	2SD601-YQ or 2SD601-YR or 2SD601-YS or 2SC2712-LG or 2SC2712-LL or 2SC2712-LY
★★	Q902 – 907 Chip Transistor	UN2216 or DTC143TK
★★	Q909, 910 Chip Transistor	2SB709-AQ or 2SB709-AR or 2SB709-AS or 2SA1179-M4 or 2SA1179-M5 or 2SA1179-M6
★	D901 – 903 Chip Diode	MA151K
★	D904 Chip Diode (KEH-9030SDK/WG)	MA151A
★	D911 – 916 LED	SLR-320MT3
★★	IL901 – 903 Lamp, 14V 40mA (KEH-9030SDK/WG, EW)	CEL-147
★★	IL901 – 903 Lamp, 14V 40mA (KEH-9020/US, CA, G)	CEL1013
★★	IL904, 905 Lamp, 14V 40mA	CEL1010
★	LCD (KEH-9030SDK/WG, EW)	CAW1010
★	LCD (KEH-9020/US, CA, G)	CAW1002
★★	S901 – 907, 909 – 919 Switch	CSG-253
★★	S908 Swtich (SDK) (KEH-9030SDK/WG)	CSG-253
	Switch (CLOCK) (KEH-9020/US, CA, G)	
	X901 X'tal, 32.768kHz (KEH-9030SDK/WG)	CSS1010

RESISTORS

Mark	Symbol & Description	Part No.
	R901 – 904, 906 – 909, 911 – 919, 928 – 931, 936, 938, 941, 943, 944, 947, 948	RS1/8S□□□J
	R927, 932, 933, 935 (KEH-9030SDK/WG)	RS1/8S□□□J
	R934, 950 (KEH-9030/EW, 9020/US, CA, G)	RS1/8S□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C901	CKSYB102K50
	C902	CCSCH330J50
	C903	CKSYF473Z50
	C904 (KEH-9030SDK/WG)	CCSCH330J50
	C905 (KEH-9030SDK/WG)	CCSCH220J50

PROTECTIVE CIRCUIT UNIT (CWM1191)

Mark	Symbol & Description	Part No.
★★	Q1	2SB1066MF
★★	Q2	2SA1048 or 2SA608SP or
★★	Q3, 4	2SC2021F
★★	Q5	2SC1740S or 2SC2458
★	D1, 2, 4	US1040M or 1SS133 or 1SS176
★	D3	RD22JSB2 or HZS22JB2

RESISTORS

Mark	Symbol & Description	Part No.
	R1	CCN1007
	R2	CCN1008
	R3, 4, 7 – 15	RD1/4PS □□□JL
	R5	RN1P□□□JL

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, 3	CEA470M16L2
	C2	CEA220M16L2
	C4	CKPYY103M16L

Switch P.C. Board

Mark	Symbol & Description	Part No.
★★	S1 Switch (CST SET)	CSN-089
★★	S2, 3 Switch (CST IN, 70μS)	CSN-091
★	MR1, 2 Magnetic Resistive Device	SDME106A

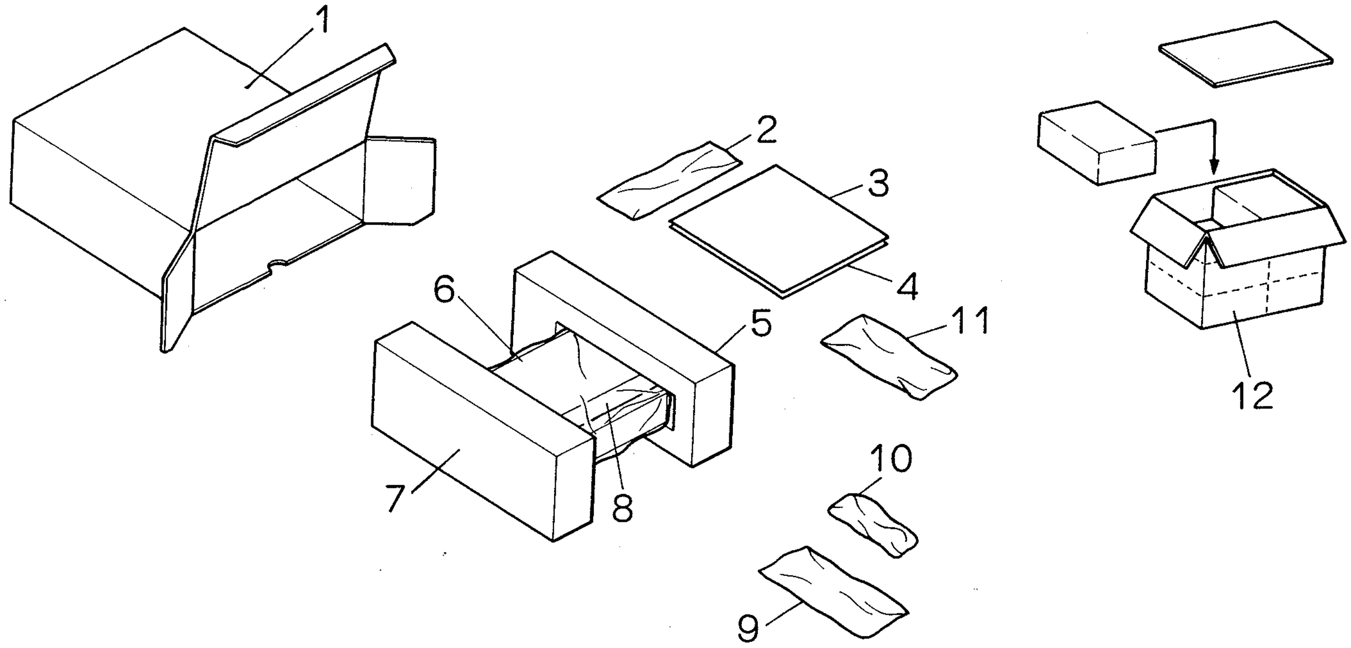
P.C. Board Unit

Makr	Symbol & Description	Part No.
★	D1, 2	1S1555

Miscellaneous Parts List

Mark	Symbol & Description	Part No.
★★	Head Unit	CXA1214
★★	M1 Motor (Head)	CXM452
★★	M2 Motor (Gear)	CXM-351
★★	M3 Motor (Capstan)	CXM1007

22. PACKING METHOD



• Parts List

Mark	No.	Part No.	Description
	1.	CHG1119	Carton (KEH-9030/EW)
		CHG1120	Carton (KEH-9030SDK/WG)
		CHG1122	Carton (KEH-9020/US, G)
		CHG1123	Carton (KEH-9020/CA)
	2.	CEA-862	Remote Switch Assy (KEH-9020/US, CA, G)
	3.	CRB1023	Owner's Manual (KEH-9020/US, CA) (English)
		CRB1026	Owner's Manual (KEH-9020/G) (English)
		CRD1027	Owner's Manual (KEH-9030SDK/WG) (German, French)
		CRD1028	Owner's Manual (KEH-9030/EW) (English, French, German, Spanish)
	4.	CRB1024	Owner's Manual (KEH-9020/CA) (French)
		CRD1029	Owner's Manual (KEH-9030/EW) (Swedish, Norwegian, Dutch)
	5.	CHP1035	Styroform
	6.	CEG-114	Cover
	7.	CHP1034	Styroform
	8.	CNH-119	Holder
	9.	CEA1076	Accessory Kit
	9-1.	CBA1002	Screw
	9-2.	CDE-437	Cord
	9-3.	CNF-111	Strap
	9-4.	CNF-382	Lever
	9-5.	CNV1009	Bush
	9-6.		Screw Kit
	9-6-1.	CBA-028	Screw for strap
	9-6-2.	NF40FMC	Nut
	9-6-3.	NF50FMC	Nut
	9-6-4.	PMB50Y160FMC	Screw
	9-6-5.	WS40FMC	Washer
	10.	CDE1278	Cord Assy (KEH-9030SDK/WG)
		CDE1279	Cord Assy (KEH-9030/EW, 9020/US, CA, G)
	11.	CEA1071	Cover Assy
	12.	CHL1122	Contain Box (KEH-9020/US)